General **summary**

It was shown, in our previous works that one could support and steer the global movement of a compressive part which is realized in a fixed cylinder by the superimposing of a supplementary subsidiary crankshafts and a master crankshaft. This had been called the poly induction mechanical support. (Beaudoin) This allowed the understanding that the global movement of a piston of a standard rotary machine may be considered as an addition of a circular and translationnel movement.

But, although this type of support mechanics created a new division of time and of the internal movements of a conventional rotary machine, it continued, like conventional mechanics, to produce fatal counter push, deferred to the rear part of the piston.

The Turbinary engine is based of the fact that we can utilise the division of the movement realised by poly induction advancement , but this time do not attribute this division to mechanical part, like master and subsidiary crankshaft, but attribute the movement to piston and cylinder. The most central and polar and important realization of Turbinary engines consists in having deducted altogether, the master and subsidiary crankshafts of the support mechanics of the piston of a machine, and consequently to have supported pistons on a set or group of subsidiary crankshaft installed directly in a rotary way in the side of a machine, this mechanical organization producing which is where a translational movement of the piston.

This also means that the ratios of retro shooting of the piston on itself and the shooting of its center in regard to the centre of the machine will be according to the new ratio of one to one, and no longer of 3/2, as in conventional kinetics, which will have the effect of realizing an equal acceptance of the pressure on each side of the piston, and of totally shielding against forces usually found at the rear of the piston.

This realization also shows that to keep the kinetic relationship between parts intact, the movement of the master crankshaft, stopped, must be transferred to the cylinder, and in opposite direction. The cylinder, in post rotary representations, will turn in contrary way than the one of the translation of the piston. Its speed of rotation will be accorded to its number of sides. For example, in a double arc cylinder, and triangular piston, the speed of the retro rotation of the cylinder will be of the half of the rotation of the subsidiary crankshafts.

The second variant of the solution of Turbinary engine consists in having shown that the rotary action of cutting off the master crankshaft of a rotary machine can be realized in a partial way, and this not only according to different degrees, but also according to different figures.

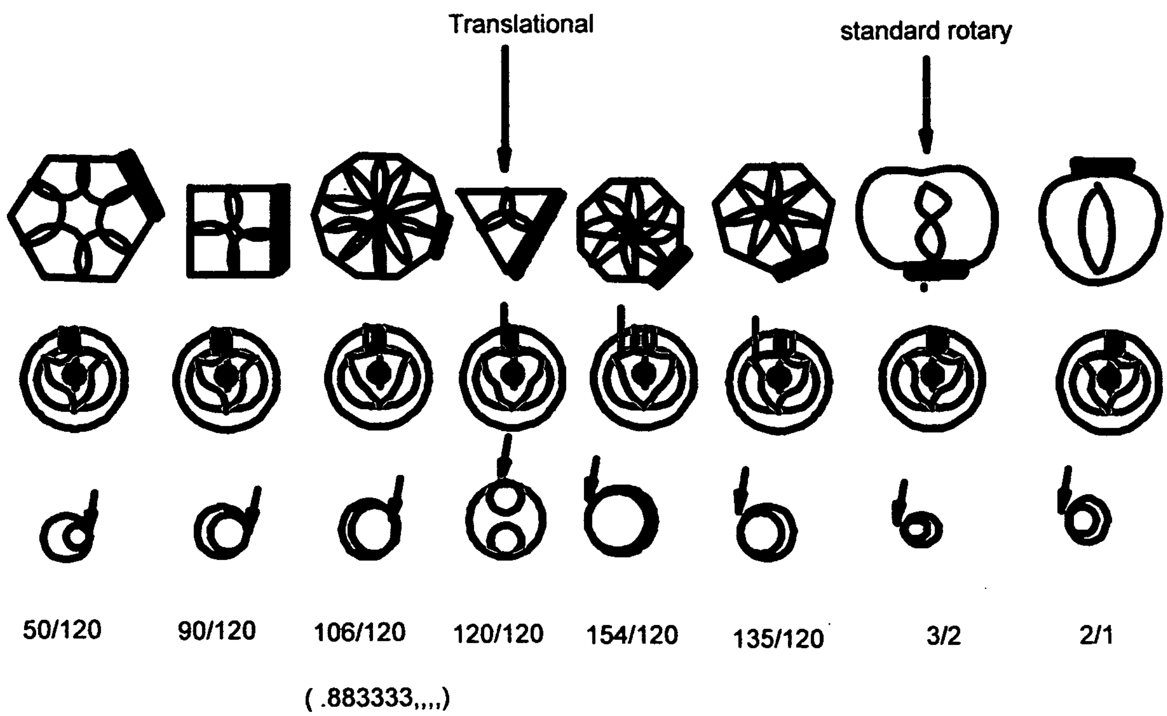
Many variations of kinetics quite partially Turbinative type may be realized. The major importance of this generation of new machine figures permit to modify the ratios of

gearings of the mechanical support of the piston, in several ways, consequently, these new ratios will imply several new divisions of the thermodynamic realisation of each side of the piston. New and more functional shapes of cylinder and piston will be from now on possible.

In fact, this will have as fundamental effect to allow the new rules of machine gear ratios according to the chosen kinetics, being spread out, for the same compressive part. So the positive push on the same piston will vary , in relation to its kinetic, and will a very retro rotational one, retro rotational, retro rotational with high translational content, translational, post rotational with high translational content, post rotational, standard, very post rotational and low translational content.

More particularly for these kinetics, the number of explosions will be able to, always for the same piston / cylinder group and according to certain particular kinetics, be strongly increased while maintaining the very few positive translational effects. The next figure calls back variations of kinetic, and the variation of balance of effort of the explosion.

Fig.1:



Because these gear ratios are all, for the same piston, relative to the length of the same eccentric, they produce a variation in the balance deferred before of the push on the piston which will be in the same proportion.

They will allow the realization of a translational machine or a machine which is high in translational content, producing practically counter-push on the piston. The design of volumetric engines will now give us the capacity to realize a perfect equivalence between the places of ignition, the times of ignition, the forms of the piston and a cylinder in expansion, in perfect correlation with the various types of mechanical acceptance of push realized according to specific kinetics.

None of the quoted authors can aspire to such results.

At Beaudoin, the cylinder remains fixed, and the kinetics of the conventional piston and consequently the ratios of gearings and conventional balance of the push remain fixed. In other figures of Beaudoin, the piston, during the rotation of the cylinder is supposedly realizing a alternative rectilinear movement, and this figure is not realisable.
At Wankel, the two compressive parts are strictly realizing circular movement, and consequently the expansion of the piston is rounded off and not perpendicular. The machine is not producing any planetary movement, and consequently no division of this planetary movement.. In addition, the number of compression is decreased to one per rotation and not increased, and the level of rotational capability or liberty is not split up, but not decreased. Finally the ratios of gearings and balance of push on the piston remain conventional.

At Schwam, the organization of compressive parts of the engine is very specific and unusual. In fact piston and cylinder are motivated around a central part of support part, which will return supplies in gas, electricity, and water. The feasibility of that this kind of organisation is practically impossible. The organisation structure such as shown by Schwam is also problematic, in the current state, because it need to realize two exist power of the same sped, and of a contrary motion, what is not commercially possible for the majority of engines applications. Finally, the organisation structure such as shown by Schwam is also problematic, in the current state, because it do not permit the realization of the mechanics that are necessary to steer the piston, the cylinder, and the eccentric relation movement

Schwan is of that opinion that it's explosion will equalize the speed of movement of the eccentric and the cylinder. Our works permit to establish that , first, when the eccentric and the cylinder are realizing a similar speed, the piston has a strong retro rotational receptivity, and need to be controlled by a retro rotational type of gearing. By an other side, our translational kinetics showed, when the retro rotation of the piston on itself is equal to the one of the rotation of the eccentric, that the volume of expansion of the piston , and its speed, are the double of the one of the cylinder. These two ideas prove that it is impossible in the same time to have, in a rotary machine an equal push on each side of the piston, and an equal sped of this piston and the cylinder. This would be,

ideally, the only way that would permit to realise a machine without mechanic. It will be impossible to obtain an equal resistance, and explosion will automatically stick the parts of the engine

In fact, it is unthinkable to support the crankshaft and the eccentric, as well as the specific de rotation of the piston will be able to be made in a natural way. Any kinetics and any mechanics do not support Schwam's comment. On the contrary he recalls those of Wankel.

Shwam never evokes the translational kinetics. He also do not presents any example of the kinetic its machine.

In resume, the organisational aspects of the Shwam's machine, center support member and double exit axle of power, are not possible in the industry. The machine is also not realizable without mechanical specific supports, witch would not the one of the art. Finally , no example of the machine are presented , so we cannot know if effectively , it would possible , in a kinetic way

Finally, the Brodov invention simultaneously contains two sets of groups of compressive parts which are interlaced, and each of the compressive parts is supported by a mechanical induction. Two more specific realisations are described by Brodov. In the first, two element are coupled together in a differential movement, and, one of these has simultaneously a planetary movement, witch would be supposedly realised in a cylinder.

It has to be said first that Brodov always presenting figures that suggesting not only machine in witch the degree of liberty would be raised, but also, in witch the elevation of the degree of liberty is obtained be the addition and synchronization of machine that are keeping intact there intern standard degree of liberty and standard ratio. Brodov machine are, for the first a combination a differential machine and planetary machine, and for the second, two planetary machine that are coordinate on the same center fixed cylinder, the forts planetary system enveloping the central part, and de second moving inside of it. Turbinary machine do not proceed at all in that way.

In fact, Brodov never realize any machine in witch the dynamical synchronisation of two dynamical part would be obtained by the division, and not the addition, of standard movement, this preserving the standard degree of liberty. Also Brodov is never construction machine in witch the elevation of the degree of liberty of the machine would be obtained by the elevation of the degree of liberty of one of the divided planetary movement of one of the element, what are doing Turbinary engine.

More particularly, many problems occur with figures descriptions of Brodov. The most important is the following. To make possible the realisation of a part that would be, in its exterior and in its exterior coupled to other complementary element, in a way to produce, simultaneously synchronised action, its absolutely necessary, first, to establish the figure of this two systems as two different figure. But, in all the work of Brodof, we never have any other that figure that the one of the post rotary triangular piston turning in a double

arc cylinder , or in figure 2, its reversion, a post rotary cylinder, turning planetary on a two sides fixed piston.

So, in any place Brodov proves that he do has the knowledge of several post and retro rotary figures of the art, witch would have been strictly necessary to permit him to realize its machine, in a complete way. In fact, as we can see in figure 1 , we never see the exterior cylinder of the machine, in witch the exterior curvature of the piston would be supposed to travel . The figure is always staying un complete, and so the claims of Brodov has no more value that a simple supposition.

In figure 2, interior piston is travelling in a fixed cylinder witch has also an exterior curvature, and, simultaneously, another exterior piston is also travelling around the exterior face of the same fixed cylinder.

Like in the figure 1, Brodov never show a complementary action of two dynamical planetary parts coupled and synchronised together, and in these kind of figure, the elevation of degrees of liberty of witch Bradov is speaking in no mere that an artificial addition of machine keeping there standard degres of liberty.

Other more specific remarks has to be added. For example, if we complete our self the figure 1 of Brodov, opposite movements are asked of the same part. This is technically impossible. Then the next impossibility, or the extreme difficulty to establish a complete mechanic arrangement that would mechanically connect sub sets, or groups of compression, to the sets, preventing push on their elements from realizing engine effects on its central axis. In fact, it seems to us that associate differential sub system to an eventual planetary system would not permit to confirm that energy produced in a system travel in the other to realise en effect on central axle. In the variation of the figure 2 , not only as we are found as in one, an absence of complete mechanical descriptions and explanations which would confirm this, but also movements of internal piston who, when used as a driving movement, realizes even more important counter force than that of conventional engines.

Besides these features, the Brodov engine is characterized by its number of raised compressive parts, and is of an even higher level of inductions supporting them or possibly to support them, all while keeping and preserving all the manners of conventional ratios, it which is obviously against the objectives and methods of Turbinary engines

Resume

In summary all quoted inventors keep and preserve the same ratios of gearings as those of the conventional engines, and consequently the same ratio of push on the piston, while Turbinary engines, due to their kinetics, establishing ratios which are very practical it, transforming the heat of the explosion into total or partial translational movement and not in friction and in knocking.

It appears that only two of these engines are however functional, the first, the Beaudoin engine (2001), with fixed cylinder housing, and the second, Wankel, is the differential type of rotary engines.

The two other engines (Schwam and Brodov) appears to be mechanically dysfunctional and from the kinetic point of view. That of Schwam is deficient at the organizational, theoretical and mechanical levels. That of Brodov always has a high level of rotational qualities, implying interlacing compressive parts, witch are not showed (fig 1) or not directly coupled , and in witch the mechanical effects seems to be not assured , and possibly un functional

None of these engines achieve the distinctive simplicity, flow, and variability characteristics of the Turbinary engine.

Normand Beaudoin.

General reminders of problems connected to the rotary machines, and objectives of the solutions brought by Turbinary Machines

It is relevant here to firstly, recall the following elements, some relative to the forms of rotary machines, and other relative to mechanics used by these machines. In second place, it is also relevant to remind the contributions of Turbinary Machines.

Geometric and kinetic rules of the conventional machines

The conventional rotary machines are defined as machines in which piston's movement is realized, inside a fixed cylinder, in a way that each of the points of the piston produces the same planetary shape. It is evident that the cylinder needs to have a material shape which is identical to the one that realizes these points. One usually classifies machines mainly as post rotary and retro rotary kinds of machines. In the first one, the cylinder does have a number of sides lower of one of that of the piston, while for seconds, the number of sides of the cylinder is superior of by one to that of the piston.

These two parameters are directly related and unchanging.

Mechanical rules of conventional machines

Very austere, rigorous and impossible to circumvent mechanical rules of realization subject these machines since their creation. In all mechanical induction of piston, we found a support and an induction gears , which are respectively the gears that are fixed , for the first on the bloc of the engine, and the second, on the piston. *It is extremely important to note that the ratio of these gears is always identical to the ratio of that of the piston and the cylinder*, and the thickness of these gearings must be determined in a way that their difference of thicknesses is equal to that of the diameter of eccentrics supporting the piston.

As a consequence, all the possible mechanics of support are also under two categories, as they divide pushes on the piston according to gear ratios, or into perfect halves.

The simplest two examples are that of the mono induction, and that of the induction by intermediate gearing. In the case of mono induction of a post rotary machine, push is, when the machine is of a post rotary type, positive in front of the piston and the negative one is in the rear of it. In the case of mono induction of retro rotary kinds of machines, push is positive behind, and negative is in front of the piston.

In the case of induction by intermediate gearing, back and front pushes and are equal, and positive push, post rotary and retro rotary type of machines, is situated on the back of the piston, and push in opposite direction of the direction of rotation is on the front of the piston.

Deductions of geometrical and kinetic limitations

It is evident that the only typically useful figure is of post rotary type, because it is the only one susceptible to produce a high enough compression ratio to allow the explosion of an internal combustion engine.

Deduction of mechanical order

It is evident that because mechanics by intermediate gearing separate the effort in two equal parts and in two contradictory pushes, of which the positive push is on the back part of the piston, which establishes the least convenient combustion area to the development of the explosion, which can not be used. More than that, it is difficult to ask to a mechanic that is dividing the piston into equal parts, to realise a more expansive displacement of the front of the piston that in the back, required by the specific kinetic of standard machines. Consequently, in spite of the inherent difficulties, the only useful mechanic is a mono induction mechanic. We will see that specific realisation of the actual invention will separate the piston in two equal parts, and these mechanicals supports will be applicable.

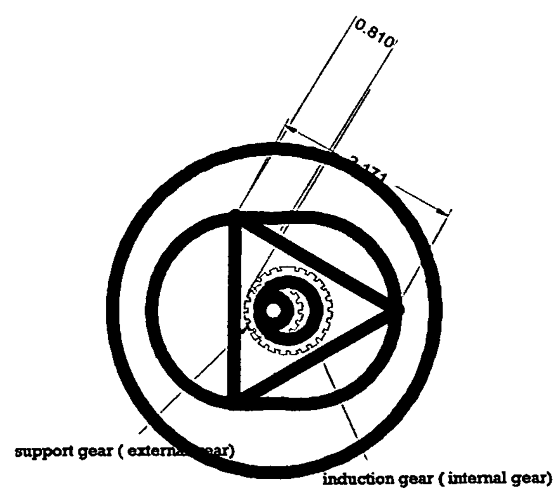
Conclusion

The conventional rotary machines are finally only realizable in their post rotary version, with double arc fixed cylinder and triangular planetary piston and with a mono induction mechanical support.

Thermodynamic problems of conventional rotary engines

By arranging the parts of a rotary engine in the course of descent or an expansion, one can note characteristic defects that are occurring in this type of machine, when it is realized in conventional kinetics.

Fig. 1



A) One counter push of the explosion is produced on the back part of the piston, and consequently, a sparkplug producing a weaker explosion is arranged in the back part of the cylinder. This occasion of friction, creates an inadequate and incomplete burning of gas.
B) In the machines in which an intermediate mechanical support is utilised, le positive push is not occurring at the place where the expansion between piston and cylinder is the greater.

Objectives of Turbinary machines

The present inventor was strongly interested, since 1983, to resolve problems inherent to the engines in such a way to fight effectively against their effects in global warming, and in consumption of energy not only by decreasing the production of CO_2, but also by decreasing the direct heat realized by the combustion and by the friction. It is so important to say that it is not a question for us of creating of new machine for the simple pleasure of the geometry. In fact, the mechanical means has to prove that the new kinetic may produces new interesting results.

The objectives of the present invention must be recalled

1) To decrease friction caused by harmful forces usually found in the rotary engines,
2) To realize a mechanical and kinetic effort more compatible with the development of the explosion, and increase of the energy efficiency of the engine, this particularly by the realization of a perpendicular or almost perpendicular expansion of the piston, and energy susceptibility of which is distributed in a more equal way among rear and posterior sides of the piston
3) To decrease acceleration and slow down of parts, this allowing to lower the level of low movement of the engine, and to increase the level of high movement, this producing a reduced production not only of CO_2, but also of direct heat, and a decrease of the mechanical resistance, when a part of the engine is not fed
4) To decrease the consumption of energy produced by the effort of cooling of the engine, by decreasing the last two factors
5) To decrease, by the increase of compression by turn, the thickness of the engine, and therefore its weight and its congestion
6) To increase the possibilities of realization of engines, which are too restrained and limited in their current state.

Links and relations between material limitations and geometric and kinetic limitations

Reminder of the four basic figures of Turbinary Machines, and of their four kinds of possible relations, in connection with the new types of mechanizations to be used, according to new implied ratios.

It is a question of understanding that in the traditional rotary engines, one establishes first of all the shape of the piston, and by following this movement when led generally, one can notice the figure of the movement of these points with regard to the block. As *cylinders and block are merged* here, the *Material figure of the cylinder is equal to that of the figure of Movement with regard to the block.* As a consequence, even in the conventional rotary engines, the Material figure of the cylinder does not exist in itself. It is, even in these engines, the material realization of the figure of the Movement of the piston. Consequently, even in the conventional engines, the Material figure of the cylinder is *only the result of the dynamic figure of the Movement of the piston*, which allows us to think, even in this type of machine, the figure of Movement as *a geometric and kinetic limitation.* This means that Material and geometrical limitations are the same As a consequence, one notices easily that the number of summits in the running of the piston realizes a number of high points, thus an independent geometrical figure, this number of high being points equal among compression after the addition of the cylinder, and which produces, on one hand, a geometric figure which is similar to that of the cylinder, which is also completely logical because the cylinder is fixed, but also, the *Geometric shape is previous to the inclusion of the cylinder* and is a part of geometrical and dynamic parameters which shall subsequently allow to establish their place of ignition and air valves. But, as one sees it, *the cylinder was not necessary for the establishment of the figures of the Sequence of compressions*. So, in conventional machines, the cylinder, as Material apparatus, comprising its holes of gas circulation, is a result of Movement, Geometrical and Sequence figures. Finally, as the cylinder is fixed, the piston can not in any traditional machine realize the geometrical figure by jumps, or at intervals, and consequently, the figure of the sequence of compression is successive and identical to the geometrical figure and to the material figure of the cylinder. So it has to be said that if on one side, all these figures exist in standard machine, on the other side, we can see that all these figures are already married in the cylinder. In fact , it is their resemblance through a very simple realization which persuades that one can define a rotary machine according to only its material parts. ***Indeed, in rotary engines with fixed cylinders, all these figures are connected and are imprisoned in a single one.*** This explains the important mechanical limitations which have to undergo motorists during their realization.

The originality of the Turbinary engines consists of what these become, when the cylinder is put in action, in a way to complete a division, and a subtraction of the planetary movement of the piston.

The four basic figures of Turbinary Machines are the figure of Movement of the piston in regards to the block, the Geometrical figure of the set of the high dead points of the piston, the figure of Sequence of realization of the geometrical figure is the sequence of realisation of high dead points of piston, and the Material figure of the piston and the cylinder,. These figures must all be considered as geometrical devices or limitations necessary for the realization of Turbinary engines, and these figures have besides their mechanical precision, correspondence which is specific and impossible to circumvent.

The following four cases of kinetics happen then, which are relative to our main demands

The first scenario happens when the shape of the figure of movement of the piston points describe a circular shape, in which the diameter is the same than that standard eccentric, and simultaneously,

when a geometrical shape of the compression set is equal to the piston but not, like in standard machine, to the cylinder, the sequence of obtaining this successive being successive and realizing a shape similar to that of the piston shape and similar to the Geometrical shape, and not, like in standard machines , to the cylinder, these forms being quite various, from the shape of the material cylinder, to the figure of Movement of the piston. In this first scenario, the machine has inevitably a translational movement of the piston, and the cylinder is realising a rotational movement, in opposite direction, or in the same direction as the Material figure being of post rotary, or retro rotary type. This case happens when the speed of retro rotation of the piston on the eccentric and is the same that the rotation of this eccentric are no longer relative to any of the aforementioned ratios between the piston and the cylinder, but by a ratio of one to one.

The second scenario happens when the figure of Movement, the geometrical figure and the Sequence of succession are quite similar, but simultaneously different from the material figure. This scenario happens when the piston realizes the figure of the rotary machine of the opposite type of the material figure, for example when a piston of three sides moves in a figure of movement of four sides, realizing a retro rotary kind of machine, in relation or correspondence to the block of the machine, while its Material figure has only two, so being of post rotary type

The third type of figure happens when the number of sides of the Geometrical figure is increased, while keeping a successive realization of them. In this case, the shape of the geometrical figure is similar to the figure of its Sequence of realization, but these figures are different from the figure of Movement, and also the Material figure. This kinetic happens notably when the number of sides with the geometrical figure, successively realized is superior to that of the shape of the opposite type of the Material cylinder. For example, this happens when the material figure is a triangular piston moving in a double arc cylinder, so a post rotary material figure of the machine, and a geometrical figure, for example of five, six, seven sides is realised successively.

Finally the last scenario, (but according to us, is the most important, because it realizes simultaneously a partially translational movement of the piston, and increases the number of explosions) happens when, for a given Material figure, the figure of Movement of the points of the piston is similar to the Geometrical figure, but with the difference that this geometrical figure is obtained with a figure of Sequence of different realization, realized at intervals, obtained with more than a rotation of the central eccentric for complete cycle of the cylinder, these being figures quite different from the Material figure.

Intrinsic relations of these scenarios with mechanics

It is extremely important to understand the relationship of figures and mechanical components and relations of ratios has been described in our disclosure, and we shall recall it here briefly. As we will show, the new ratios produced by the new kinetic will allow to balance the read and push action on the piston in a way that bad pressure will be subtracted. We consider that this will be a major contribution to art of volumetric engines.

First scenario: geometrical and mechanical correspondences

In the first case of figures, the only way of producing the next summit of a piston, that is the next place in which its crankshaft will be perpendicular in the next face of the piston, is to realize a retro rotation of the piston on its crankpin equal to the rotation of the eccentric supporting it. To do this, the piston must be so controlled by one orientational mechanics implying support and induction gearing ratios of the order of 1/1

Specifically, the command of the crankshaft can be obtained not only by any induction of which the ratios of gearings are of one to one, but also by the simultaneous supplementary command of several rotarily ascended crankshafts arranged directly in the block of the machine, or still by a mechanic in which the material ratios are not of one to one, but so the result of the organization of the gearing support is of one on one.

As for the retro shooting or shooting of the cylinder, it can be obtained by inversed semi-transmission, by cogs or external and internal gearings, by downward mechanical induction leaving of the piston

Second scenario: geometrical and mechanical correspondences

In the second case of figures, it is evident that if the figure of movement of the piston with regard to the block is that of the figure of the opposite type of machine that that used as material cylinder, mechanics used must correspond to it.

This scenario happens when the next high dead point of the piston occurs in the middle of the next side of the figure of Movement of the opposite type.

The ratio of retro rotation of the piston on itself and the rotation of the central eccentric is equivalent among the number of sides the piston on that of the shape of the figure of movement, so when this shape correspond to the shape of the fixed cylinder of the contrary type of machine, the ratio of support of the piston will be of retro rotary type even tough the material figure of the machine is of post rotary type. Geometrical and Sequence figures are in this case , similar to the Movement figure. *As a consequence, not only the ratio of gearings, but also the type of induction will be changed.*

Indeed, if one takes for example one pistons of three sides , motivated in a material cylinder of two sides, and according to one geometrical shape of four, piston orientation mechanics will no more be of the post rotary type. In fact, the gearing of the piston being now not only smaller than gearing support, but also the types of gearings attributed to each part, internal and internal , will be reversed The ratio of these gearings will be from then no longer of 3/2, but of ¾. So the positive push will be on the rear of the piston, and rear and front part of the piston will be separate in a new place.

The third scenario: geometrical and mechanical correspondence

The third scenario happens when the sides of the geometrical figure are realized successively, and when the number of sides of this figure is superior to that of the shape of cylinder of the opposite type of rotary machine. In this case, the figure of movement will become different from Geometrical figures and of the successive Sequence. The ratio of gearings is established, like before, according to the retro rotation of the piston and the rotation of eccentric sound necessary for the realization of the next high point, or its next compression, if one considers the used material cylinder and the obtained geometrical figure.

For example, for a geometrical figure of six sides, the Figure of sequence which is similar, the retro rotation of the piston in the next point, equal to 360 on the number of quoted, will be later made 360 / the number of quoted with the geometrical figure, so 360/60.

The ratios of retro rotation and of rotation are so thus 60 to 360, so 1/ 6, what as first pulls the use of an induction of retro rotary type, gearing induction being here of external type, and the gearing support of internal type. One notices that the retro rotation of the piston is more pronounced there, than when the geometric figure is the opposite type figure..

All these machines will be consequently realized when not only, the type of inductions will be inverted, but also when the ratio of gearings will be smaller than those of her against shape. Here, 1/6 is smaller than ¾.

Note: we always attribute the superior number to the induction gear of the piston, and the inferior one to the support gear of the engine. For example standard ratios of these are 3/2 .

Fourth scenario: geometrical and mechanical correspondence

As we mentioned it above, the last kinetic scenario happens when the geometrical figure, similar to the figure of movement, always different from the Material figure, is realized in a Sequence at intervals from which the figure is consequently so different.

This figure happens inevitably when next top point of the piston is situated between the standard position, and the position of the first face of the figure of opposite type of the machine, by excluding the translational position of the next point. For example, for one hatch in triangular piston, and in a cylinder with double bow, this figure comes true when the place of the first high break-even point of the piston happens between 90 degrees and 180 of the shooting of the eccentric, **by excluding in the position 120 degrees, relative to the translational movement.**

In this space, the number of faces of the Geometrical figure will be inevitably increased, since these will be realized at intervals, the ratio of shooting motivated by the retro rotation of the piston and the rotation of the eccentric for the next high break-even point will be capable of remaining near the ratio of one to one , attributed to the first scenario, while increasing the number of faces of compression, what will be an experience. When the next place of high break-even point of the piston will be between the translational point, or generally 120 degrees, and the conventional point of fixed cylinder,

so among 1/1 and 3/2, the type of mechanics used will remain the same, so post rotary, but ratios will be advantageously modified. The quality of these ratios will decrease the new high break-even point of the chosen piston more so, so that it will be near ratios with fixed cylinder.

In these kinetic, piston and eccentric are travelling in a contrary direction than the cylinder.

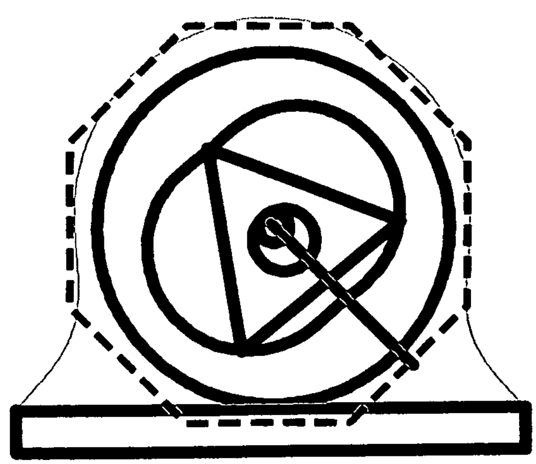
Besides, when the ratios of shooting will be, always for exemplary piston of three sides among 3/4 and 1/1, the type of mechanics will be changed. It will becomes of retro rotary type. But if the ratio lives near one to one, as for example of 8 to 9, the balance of the push will be very acceptable, and the form of the piston will be changed to permit a good acceptance of a smaller greater push of the rear of it. This balance of the push will decrease progressively when the next pip not will be near those of the translational figure. as for example, a ratio of 13 /16

First, the ratio of shooting or of retro shooting of the cylinder will be established according to the difference of the high break-even point of the piston in kinetics with fixed cylinder, and the first high break-even point, in Turbinary kinetics, and will be obtained with the same mechanical devices, and according to these new ratios.

Supplementary precision relative to these ratios

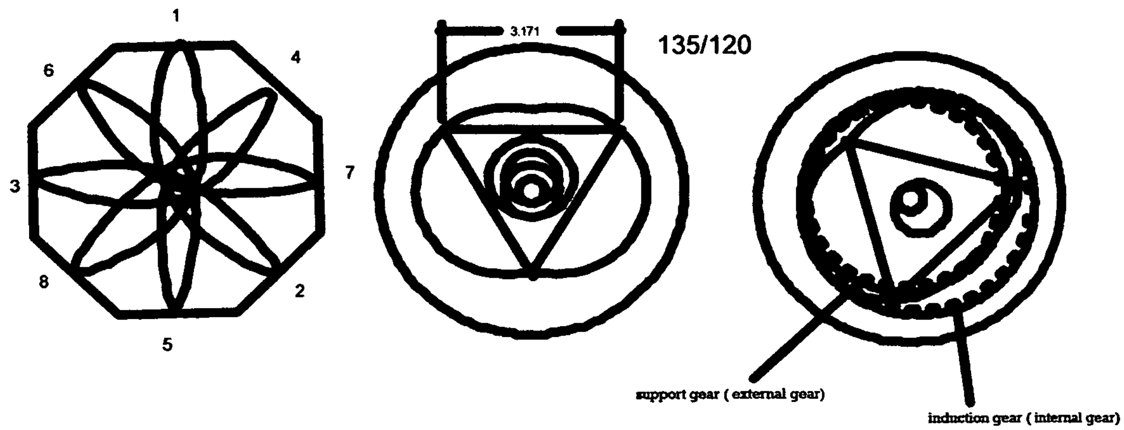
We add here, from chosen examples, some supplementary precision which will prove why, this type of kinetics, by the new mechanical ratios which it produces, allows to realize machines in which their thermodynamics will be highly superior, that is, in which the mechanical susceptibility of the push of gas will be distributed not only between every part of the piston, but also more central. For example, one can realize a geometrical shape in eight, by jumps of two, what will support a gear ratio of shooting of the eccentric of 135 degrees on a ratio of retro shooting of the piston on its crankpin of 120 degrees. The cylinder will have so realized a retro rotation of 45 degrees.

Fig.2



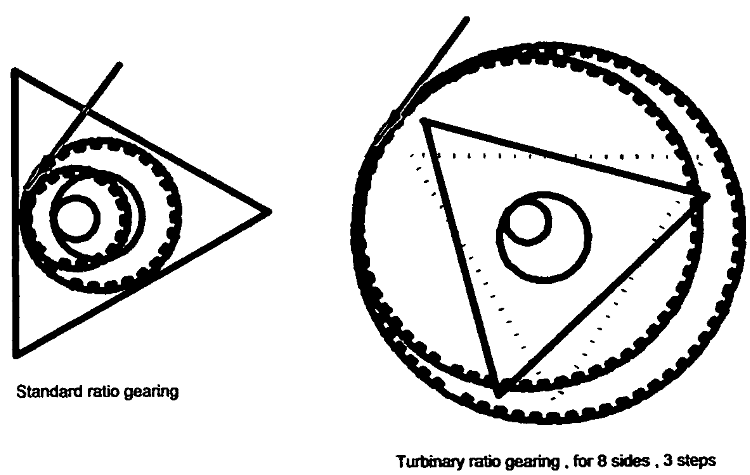
As we have already mentioned it the ratios of gearings will be equivalent in these new ratios of shooting. In this case, because the next high break-even point is after the translational place, gearings will remain of post rotary type. They will be so 135 on 120 , 27 /24, or of 27 for the internal gearing of induction and 24 for the external gearing support mechanical understanding of the cause of the improvement of these machines.

Fig 3



We mentioned in several places that the length the eccentric remained equal to that of the material eccentric of parts, and we recalled as well that distance between gearings was, to keep the coupling of it throughout the cycle, be so that it remain equal to the diameter of shooting of the crankshaft. One sees so clearly, in the following figure, that distance kept between gearings, and establishment of their new ratios force it to swell inevitably. One sees so clearly, because elements were placed in descent, because negatives push on the rear of the piston are in every case practically neutralized. One to see as well as the balance of the energy susceptibility of the piston is close to that of the equality of parts, and more central.

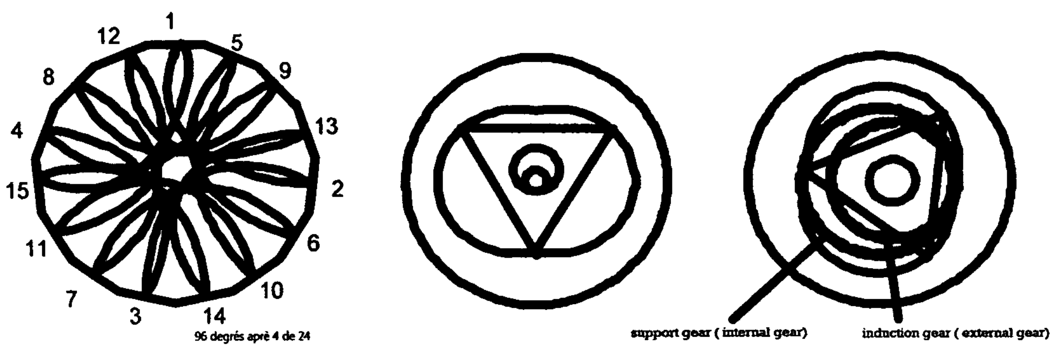
Fig 4



One sees that although the piston works positively on all its length, gearings separate the good and bad pushes in the conventional kinetics.

In the following example, the next high point occurs after 96 degres.

Fig: 5



The machine can be also realized positively during the next high break-even point situated this time among 1/1 and the number of sides with the piston on that of the opposite type of figure, which enters 1/1/ and ¾. In the example which follows, the next high break-even point of the eccentric is after the fourth face, or 96 degrees, so is always in the place and the relevant ratios. The piston will consequentially have a retro rotation of 120 degrees by rotation of eccentric of 96, or a ratio of 40/33, which will apply to gearings of retro rotary type. In these last cases, the geometrical figure will be realized with more than a rotation of the eccentric.

One sees here that the type of gearing is inverted, and that their thickness is strongly improved, these ratios being realized by respecting the initial material distance of length among them, equivalent, like in conventional machine, to that of the diameter of the eccentric. It follows itself if that coupling is this time in the previous part of the piston, as it is the case of mechanics of retro rotary press type, but this time forward enough to not produce any more counter- push. The biggest part of the push will be situated on the rear part of the piston, but in a ratio of improved balance with 33 to 40, by opposition to 2 /3 in conventional machines. Let us note that here, the high point is near that of its counter-shape, but it is important to understand that we can design the machine in such a way that it could be much closer to the one to one of the translational dynamics .

Note:

We have added in appendix several examples of drawings showing very different kinetics, several examples of Geometrical figures in N sides , realized by intervals, their different ratios, and incidence on their thickness and on balance of the effort of machines, so by more than a rotation of the crankshaft

We add furthermore some supplementary animations as well as some calculations relative to new gear ratios, and consequently of distributions of push on the piston which the invention produces, and that can not realize any of the quoted inventors mentioned.

Figures, ratios, mechanical support and directions of parts

These various variants of Turbinary machines infer ratios of rotation which are specific in each of them, and which ensue directly from ratios of figures mentioned above, as well as ratios of shooting which are associated to them.

In the first figure, or the case of engines with translational movement of the piston, the piston has a counteraction of retro rotation on its axis, but these two elements go, when observed from the outside, in opposite direction of the cylinder, if it acts as a post rotary machine, and in the same direction if it is a retro rotary machine.

In the second figure, the piston continues to realize its retro rotation with regard to its crankpin, but does not realize any more movement against its cylinder. The set piston briefly realize a movement against the central axis

In the third scenario, even counter movement and movement apply, in an even more pronounced way

In the last scenario, when the sequence of realization of the geometrical shape is realized by interval, the piston continues to have its retro rotation in regard to the crankpin, but, the eccentric **and** its piston are against the direction of the cylinder.

It is important to recall the subject mentioned above, that is to say the balance of energies on the piston is at first relative to the link of the next high injury time of the piston of the translational situation. The opposite movements of the cylinder and the piston decide only if the small difference of balance will be beneficial in the front or in the posterior part of the piston.

Note: We showed also that these ratios of direction were different in the following cases:

1) In the case of machine representation of type retro rotary
2) In the case of reversal of elements, as for example when the machine is realized from a translational cylinder and of a rotational piston.

It is also essential to mention that during rises of degrees, as for example when a global cylinder is coupled with a piston, for example translational, this piston and its eccentric can be then motivated in the same sense as the cylinder or in opposite sense . **This is the reason why producing contrary movement is very hard to realise with low degrees of liberty, and need the specific rules that we have establish.**

First conclusion

Such as it was recalled here, the ratios of shooting and the ratios of gearings which accompany them are not only completely corresponding, but more so, completely connected to the specific dynamics of Turbinary Machines. We think that, as the examiner seems to wish, the contribution of allowing us to clarify can be advantageously moved from supplementary demands to main demands, in a way that the material devices are presented to it initially.

By an other way, we continue to think that figure has to complete the ratios in claim by determining the preferable way to accomplish these ratios. In fact, realising machine only with gear ratios would possibly produces machines of which the realisation is highly difficult. For example, it is always possible to produce a perfectly mechanically coordinated machine, with for example a retro rotation ratio of the piston of 999/1000, or still 1000/999. But such ratios of gearings would be difficultly practicable, and the complete cycle of the machine being made only after 999 revolutions of the eccentric. As a consequence, when realized as an engine, the places of air valves would be reduced to their limit, which is nearly impossible.

If the integration of initially secondary demands, relative to a more material description of the ratios of gearings, in demand main clauses would be desirable, these main demands would suffer a great deal of indistinctness if one had to deduct from them the geometric-kinetic aspect, this geometrical aspect making them not only more accessible, but also, by clarifying the most relevant realizations, established on simple figures, accessible to all.

Supplementary considerations relative to the inventors quoted by the examiner.

We understood well, in the reading of the last communication of the examiner, that supplementary clarifications could be wished, which will be the aim this section. We are anxious to remind here however that the realization of one Turbinary implements a set of elements who owe, even in the case of the most simple machines to be realized altogether, otherwise the machine does not realize the concept, either still is un functional, or both at the same moment. This is why we think that the quoted inventions remain very remote from Turbinary machines, at the organizational level (Schwam), at the level of degrees kinetics (Wankel, Beaudoin, Brodov), and at the level of mechanics of support (Schwam, Brodov)

We remark that Schwam and Bradov's description do not include kinetic representation, and incomplete mechanical description, which would have been relevant for the current case. Thus we establish our consideration starting from the mechanical means.

Schwam (supplementary remarks in our previous communication)

From an organizational point of view, Schwam's engine is the antipode of the Turbinary engine, and it contains major defects which brings us back to the impracticable industrialization of it. Besides, no valid kinetic demonstration is presented by Schwam. Finally, the mechanics produce such fundamental conception errors, even simply as machine. Finally, Schwam's description applies only to a single figure of rotary machine.

Schwam's engine is extremely problematic, and that on several levels, structural and organizational construction, mechanical and kinetic

The Problems are the following ones:

A) The machine is realized with eccentric and the bloc part that have a longitudinal cavity permitting to the first to be mounted in a rotational way on a central rigid support structural part , and the second in a rotational way, on the axis of the eccentric.

This specific organization is defined in the title of the invention, in the description, and in the demands. We do think that that kind of organizational regressions by which Schwam realizes its machine will not be without the creation of considerable and insuperable problems of realization and functioning, which are mainly the following ones
:

1) The engine, which is arranged specifically not only outside the nose of the plane, but more so, helixes are situated between the airplane and the engine. This will create inseparable problems of aero

dynamism and protection of constituents, and general grading of the distribution of the weight of the plane

2) The bearings supporting the elements are badly balanced.

3) The lubrication of small cushions and the recovery of oil will be extremely laborious, canals to pass in the same internal very small central tube, this tube having a limited dimension relative to a normal axe of eccentric, stiff part as those of the contribution of gases and contribution of the electricity . The separation of these elements will be very laborious.

4) The machine has to have two axes of exits, what is not industrially applicable

5) The machine will be extremely difficult to build, with each of parts being, stiff central member, axis of the cylinder, axis of the eccentric to be provided with a circular extrusion on all its length, these parts to be fitted in a staged way the some in the others.

6) The control of the expansion of parts, and the choice of the materials of preparation will be produced extremely difficultly, the heat of the parts of the cylinder and of eccentric exposed to the being explosion very different from that exposed to the air. The weight of these elements will be important, because the whole bloc is turning

7) The integration of gases in the cylinder, by the preliminary passage through the extrusion of the central stiff part will be extremely problematic, and deficient, the time of passage of these through the wall of the stiff member of internal support, the crankshaft being reckoned in thousandth of seconds, even in a slowed down speed gases should cross the wall of the member of support, and simultaneously that of the crankshaft, the openings of these walls to open simultaneously in the opening of the air valves of cylinder, what will return the times of opening of air valves very short, so much that it is easily thinkable that the completion of the cylinder will be always deficient, even in low speed. The insulation of these parts will be besides extremely problematic. More gases will be strongly warmed before arriving at the cylinder, and this will have a bad thermodynamic effect

8) Water cooling will be about impossible

9) Electric control will be also difficult, and the adaptation of the practically impossible timing. Without a controlling mechanical means, a precise timing will be impossible

10) The realisation of longitudinal cavities, on all their length, will be hard and theses pieces not resistant , so the member of support, the axis of the cylinder, the axis of the eccentric will weaken these elements which will be able to be used otherwise only in the context foreseen by Schwam.

11) The mechanics of induction of compressive parts are, erroneous and, according to this disposal, impracticable.

C) In the kinetic point of view, Schwam does not propose any figure of new kinetic representation of his machine, but presents simply that, of Wankel.

D) In the point of view of the mechanical support of parts, the organization of the parts of the Schwam's engine is full of fundamental gaps. In fact, the specific organization of the component makes indeed practically impossible the implanting mechanics of production of the movement just as much of the bloc, the eccentric as the piston. When one knows the precision with which these parts have to act, in a rotary machine, one can not conceive the realization of a machine without support will realize delayed movement, and will realize it correctly.

Statement

Schwam supports its invention by an illustration of Wankel's kinetics, in which the cylinder is fixed, to present its invention. Schwam do not produce a figure of relevant kinetics could be filled by the fact that this one proposes a set of mechanics by means of which one can obtain and notice clearly the kinetics of parts. Now, it is a fact that Schwam describes in detail the devices which will be connected with the engine, the pumps, the internal clutch, firing , cooling, et cetera Schwam even pushes details until modify the terminal details of the engine to build a device of reduction of the speeds of helixes. (Even figure 3, and 11)

Schwam **only** speaks about opposite movement of the crankshaft and the eccentric sound, and simply when the will be perfectly equal, without appealing to the movement of the piston, which is only in certain cases privileged and precise cases in the opposite direction, and without giving any precision of variations of that according to different figures of art.

Besides, and as surprising it can appear, one does not find in the machine any mechanics of inversion of parts, no more that of orientational support of the piston. *The reason for that, like we will see, is caused by the specific organisational structure of the components that Schwam is purposed.*

Indeed, such as one can notice, on the straight part of the set piston, one finds only a single gearing, gone up on an axis of support fixed in a way not centred on the end of the eccentric. One cannot obviously produce a semi transmission of inversion with a single gearing. But any way, if Schwam had completed his system, the inversion of movements would have never been able to be realized because, so that can be possible, it is strictly necessary that the axis of support gear, or the support gear itself be rigidly fixed outside of the system of motive parts.

One sees although the ending of the member of support makes impossible this eventuality.

Schwam reaches also as resultant, the motivation of an independent propeller fig 3 producing a separate support part gone up in a rotary manner on the central member of support. This part is support one set of helixes is different from axes of crankshaft and Cylinder. Now it is on this part that are arranged the axes of intermediary gearings fig. 3 and 10,11. Now contrary to what Schwan claims, this part, subjected against rotations of roll and eccentric, if it had been produced, would not propel helixes in opposite direction, but in the same, also in reduced speed. But such is not the main objective.

What is important to notice, it is that the movement of the independent helix is a resultant, and can not be considered as source of movement of the axis of the eccentric and of the cylinder. Indeed, these parts could not see itself led in opposite movement by being pressed on a part not only mobile, but free. The axes of support of inversion gearings are not and can not, without modifying the invention to be situated on one fixed part. Once again, it is the organization of Schwam's parts which makes impossible the implanting mechanics of inversion. Indeed, if Schwam had arranged the axes of support of intermediate gearings on a fixed part, it would have been impossible for him to prolong the axis of the eccentric in a way that he can receive the second helix. It is not as much about a neglect, but about a technical impossibility resulting from the bad organizational construction of the machine.

Besides, one does not find either, in figures nevertheless hardly detailed on supplementary aspects, any fundamental mechanics of control of the piston, for which, we recall. This seems to do not be important for Schawm. No piston appear in the claim 1. Schwam is on an other side, at Fig 2, thinking that the Wankel ratios of gearing are applicable, and that is false. Like we prove in Turbinary engines, production of new ratio is inevitable when the cylinder is no mere fixed m but dynamic. And it the production of new ratios that is giving the new balance of the rear and front push on the piston. Schwam never saw that. We don't think that on the supposed central subject of an invention, that it is pertinent to simply say, like Schwam is doing, that ratios of the art are applied. Error is thus double here, and so very important when one knows that very specific and precise ratios of gearings are characteristic of Turbinary machines, and that these ratios can on no account live even as those of machines with fixed cylinder.

The reason of these neglects is double. Not only is there technical impossibility to realize these supports, and lack of knowledge of their ratio, but also, because Schwam looks for an opposite movement of helixes of the same speed, and thinking that pressure of the explosion on the bloc and the piston will produce by a simple natural way this equal movement. Schwam's figure seems simply to consider that, of only one makes that the cylinder and the eccentric will have ascended in a rotary manner, push on the piston will produce the perfect counter rotation of the cylinder in a natural way, in the order of one to one of these two elements. This is perfectly false.
But , in realty, it is not as simple as that, and for the simple reason that it is impossible to obtain, in rotary or Turbinary machine simultaneously an equal speed of cylinder and eccentric, and an equal sped of eccentric and retro rotation of the piston on this eccentric.

Now this is also false of several manners. Indeed, if one considers attentively the volume of expansion of gases realized with the piston and that of the cylinder in a rotary or Turbinary machine, one notices clearly that the volume of expansion of the piston is of the double of that of the cylinder, when the machine is realized with a triangular piston. It is noticed in a more evident way in the translational figure. The push of the explosion produces more power of the highly-rated of the piston, and the equality of counter movement looked for can on no account be made naturally. So , it is properly impossible that the explosion will produce a natural action of equal value on these part, and activate them without mechanical control.

It is necessary as well to add as push is always, in every engine, angular at a certain moment, because it is always a question, totally or in the same way to transfer a rectilinear movement in a circular movement.

In fact, the only case, in which the cylinder and of the eccentric works in opposite direction and in equal speed occurs the geometrical figure is the contrary type of the material figure of the machine. Now we know that in this case, gearings, strictly when the piston is triangular, perfectly coordinated with the geometrical figure will realize a rear positive effort on piston and simultaneously and one counter effort on front, and the t the piston work will be badly balanced. So, it is clearly impossible that the explosion will correct this problem. There is no magic in mechanics, and that there is coordinated control lose no gearings, *thermodynamics will act exactly as if they were there, and will produce a considerable un balance of each part of the piston, which will automatically block the machine.*

Now leaving of our works, we know that during this specific case of figure, directional control of the piston is absolutely necessary, when it is realized is equivalent to that of it against the material figure, and require a ratio of gearing which will absorb mainly in hard rear push on the piston. As Schawm aspires, he will be able to control explosion so that it produces exactly this ratio of push, and it in an invariable way, on the contrary one counter rotation of one to one of the eccentric and the cylinder. Moreover, it is necessary as well to add as degrees of rotation suggested by Schwam are not applicable in various versions of the rotary machines.

Of our opinion, the machine is strictly impracticable according to ratios of precise shooting, by activating parts by the only push of the explosion, which in any rotary machine is always angular, if it is not on the piston, as in the translational machine, then on the cylinder, and it is totally false to say that it will establish these ratios in a natural way and in an equal way, angular push on one global element being never the same as on rotational parts.

Now if ratios of shooting of the cylinder and the eccentric can not be obtained in a natural way, we could think that more complex ratios, as ratios amount in counter material forms leading ratios translational kinetics ratios, or ratios leading kinetics by predetermined jumps, can be thinkable.

In our works, we produced evidence to prove outside any doubt that the various ratios of shooting of parts , synchronised with various kinetics, lead an acceptance of the energy of the push of the explosion which are extremely different from one case to the other.

Schwam does well to speak about opposite direction management of the movements of the cylinder and the eccentric, but at any moment he does speak about piston direction, and at any moment he is capable of establishing if these directions managements are very opposite, little opposite, and, even more, what never seems to be case, if one can speak about opposite direction very specifically, sharp and pistons and of cylinder, because in these cases, the cylinder always turns faster than the eccentric. But, we showed that may possibilities occurs, with many ratios, and more, that this had many different thermodynamic results that Schwam cannot see because the organisational structure of its machine does not permit it. More that that we showed that the better kinetics occurs when the piston movement is translational, or near translational, et this is not when cylinder and eccentric does have equal contrary sped.

In summary, Schwam would not know how to explain that explosion can, considering different forms from of the piston and from the cylinder, and from their movement of different degrees, turn a cylinder in at the same speed, or quickly faster, or even more slowly, or finally in the same direction as the eccentric , what which can be obtained only according to suitable ratios, but can be obtained only by the simple thermodynamics.

Schwam will not be either capable of seeing how, only by the force of the explosion, the cylinder can turn exactly at a speed of one to the number of bows of the cylinder, for example of one to two of the supplementary crankshafts and so to produce a translational machine, because besides, in any Turbinary or rotary machine, friction on the piston always becomes true only in a single direction.

How an engine without any mechanical articulation will be able to fight against the friction of pistons, and besides, being not reassured, will wear out in a premature way. How this engine will behave when differential helix ratios, activated by the contribution of the reduction transmission, will be actual. As this engine it will react when the explosion will arrive before, or after the passage of the high break-even point, thus modifying the balance of push, between the parts of the piston, and modifying so the ratios of shooting of the crankshaft and the cylinder.

As a consequence, this work answers many details relative to the contribution of gases, electricity, clutch, starter, cooling, with regard to a new and problematic structural organisation of components, *but regrettably, by evading the main thing of the problem, or of one part to realize a suitable mechanical support capable of being realized in proportions expected, the work of counter rotation of the cylinder and the eccentric, then to correctly realize one global support of the piston, and it according to piston, and finally, to show how these two inductions are inter connected.* He also never gives us a minimal idea of its kinetic purpose, what would have been strictly necessary. He simply said that he intends to have a neutralisation of the gyration effect, of which we suppose that he intend to realise contrary movement of eccentric and bloc at the same speed. We know perfectly how to do that, but the problem is that a normal reader cannot find that in the disclosure of Schwam.

First of all, it is important to note that, as we called it above, the set of the engine is not only realizing a movement in opposite direction of the eccentric, but also the piston and the cylinder is very limited, and in this case, does not contain any scenario in which the eccentric would produce an opposite movement whose speed is identical to that of the cylinder. In Turbinary machine, specific movement and ratios of the piston are fundamental aspect of the invention. Moreover, Schwam does not include the piston in his first claim 1 , while he is pretending to claim an engine..

Now not only does the absence of implanting of mechanical control prevents the consistency of movements among them, but also it prevents from activating the machine by one or another of its axes, in phase of compression, which is clearly unthinkable.

We clearly see that Schwan's machine is as totally unfeasible, for the pure and simple reason that the organisational construction of Schwam do not permit the installation of any semi transmission in the block of a machine, witch is absolutely necessary to coordinate eccentric and cylinder.

Schwam's invention is not opposable not only because the organization of these constituents is there inappropriate in the correct realization of engine, but also, because this organization prevents or makes extremely difficult the implanting of mechanical inductions inherent to the controls parts, this implanting inevitably an external support, which does not exist because this machine does not contain a block, or of part of the member of central support which could be used, being only explosion unfit of ensuring some ratios of shooting and against shooting of the elements, and even less when these are uneven. Conversely one imagines with great difficulty implanting the support mechanics of the highly-rated the piston, the support on a fixed part being necessary, and the ending of the member of support not lending itself to it at all.

Brodov Ru 214 018 **(supplementary remarks in our last communication)**

Brodov does not give either a schematic figure of the kinetic of the compressive parts, nor does he disclose the mechanics entirely used to support them. To properly grasp before criticizing and differentiating it from the current application, it is necessary to not only reconstitute Brodov's invention but also to complete it. We shall then recall some of our works to better understand the specific elevation of degrees which is Brodov's contribution. In both these cases, we shall see that the preoccupations and the relative results which have been obtained by Brodov are enormously distant from those attributed to Turbinatif engines.

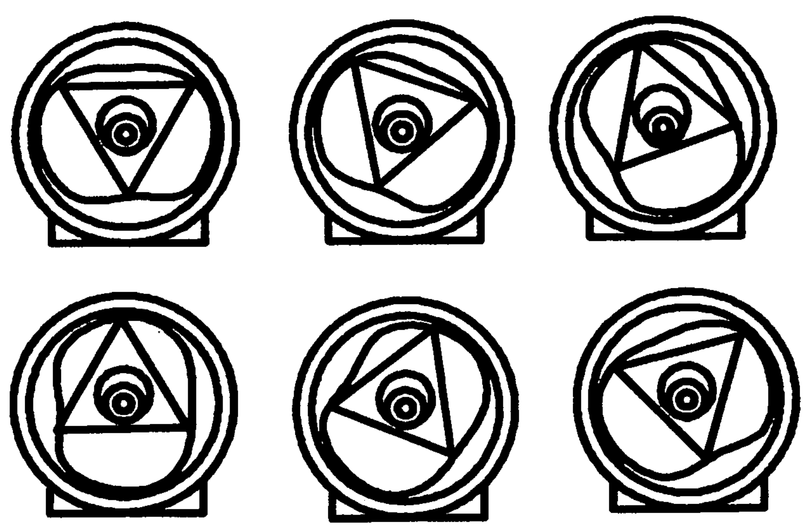
To do this, we must first recall the two main kinetics of rotary machines which will be assembled by Brodov in a layered kinetic, which Brodov describes as follows:

''All well-known means of converting movement in rotary displacement machines fall into two caterogies : rotational (differential) and planetary '' (Brodov: page 2, line 3, 4)

This first machine, called by Bordov Differential Machine, is justly quoted to Wankel to which we have previously answered. Brodov thus recalls, also from Wankel, the standard rotary engine, called by Brodov Planetary Machine, in which a piston, whose course is said to be planetary, is inserted into a fixed cylinder, which is the method currently used industrially.

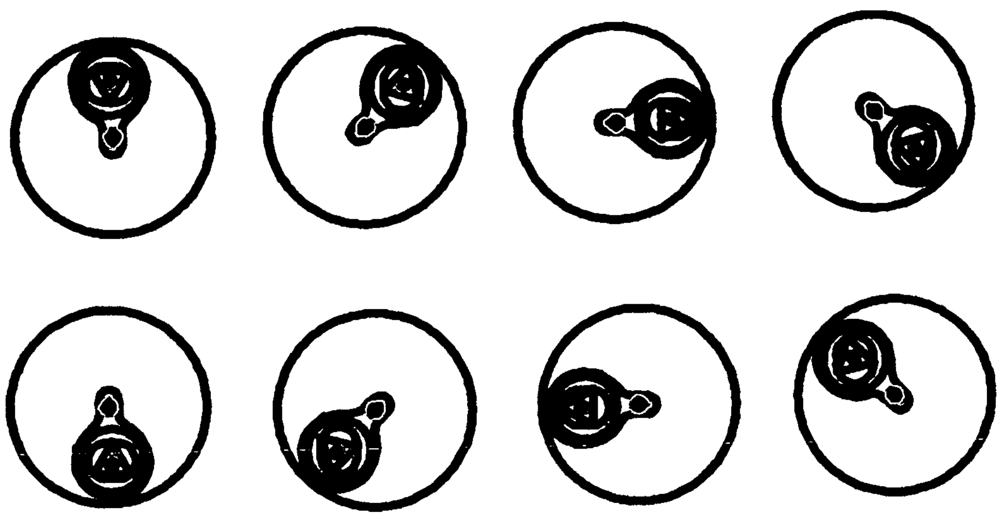
In the first machine, witch is from Wankel, the two piston and cylinder elements are simply set up on a fixed axle in the side of the machine. The first peculiarity of this invention consists in that no eccentric is set up in the machine. The second consists in that the support gear is no longer set up rigidly on the side of the machine, but on one of the piston or cylinder elements, depending on the case. We can therefore say that the cylinder and piston respectively receive the mechanical induction support gears, which implies that the ratios and size remain identical to those with planetary movement.

Fig.6



Bradov's invention takes its source particularly from this previous figure. In fact, in the first variation of its invention, Brodov have, in a certain way, mixed in a layered way the two first inventions of Wankel. But to ease the comprehension of this mixing, let us suppose, first, a construction which is much easier to grasp. Let us in fact suppose that we subtract the piston and cylinder group from the previous figure Differential Figure and which we will install on a member rotating around a single axle, which would give the following figure:

Fig. : 7



We could push even further and suppose that the group of first degree of liberty, the differential ensemble, does not have both of its support axles of the compressive parts set up rigidly on a mobile part, simply turning around an axle, but that this mobile part would be provided with an axle and coordination system, which would allow it to realize a planetary movement. But this eventuality, which seems better to us than Brodov's, is not foreseeable because Brodov then intends that one of the two elements be used as a piston of a superior cylinder. By doing this, no curve of the compression parts would be modified because each of the systems which we have just mentioned is autonomous, one being a single degree and the other being the planetary system.

Having realized this, we are beginning to approach Bradov's work, but we have not exactly realized his engine no more than its variants.

In fact, the Brodov engine is of a very bold dynamic. To realize Brodov's engine, *we will have to grasp one of the rigid axles of one or the other compressive parts of the first degree of liberty systems and lead this axle in a planetary movement around a third axle, serving as a central axle.*

The entirety of the first paragraph of Brodov's claim one consequentially consists in commenting on the implementation of the first degree of liberty system , callused by Brodov Differential machine.

Brodov goes on to say,

''and simultaneously with the rotation of the conjured elements around their axes, there is additional planetary rotation of any of conjugated around the axis of another element .... ''

In addition, as also mentioned above, Brodov mentions that for the proper conduct of the elements that the rotor must turn in the same direction as the member which supports the previous planetary movement :

'' While the rotor it self moves with angular velocity around its center, **in the direction** coincident with the movement of its center with circumference '' .... Since it's centre is now planetary.

We now see that the lower levels of Bradov's construction already and always possesses three rotation axles located at different levels, which figure 1, as well as the following, confirm.

Fig. 8

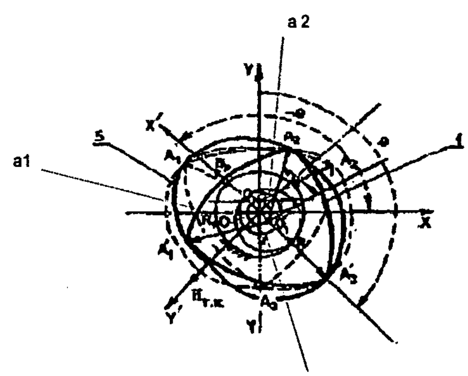
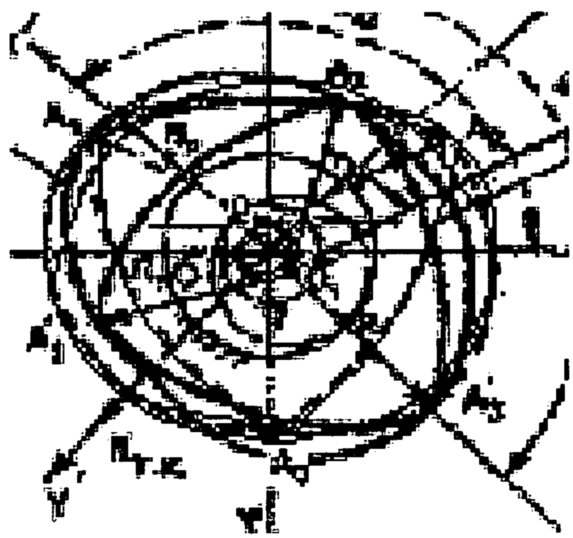


Figure 1

We could also state that in this figure, it is the rotation member of the cylinder which leads the planetary movement of the first degree group. In fact, as we can observe, Bradov has had the good idea of leaving dotted lines at the original location of the parts. We can observe that if we only realize a **simple counter rotation of the cylinder** in a way to replace it in its original angle, **and not a reversing of its planetary movement, we end up on a centre position which is completely**

different, and the cylinder thus obtained is only parallel to what it was. This confirms that it's the cylinder whose axle has been led in a planetary motion in relation to a third axle, and that Brodov never realize machine with strictly second degree of liberty of the elements like basic figures of Turbinary machines are doing..

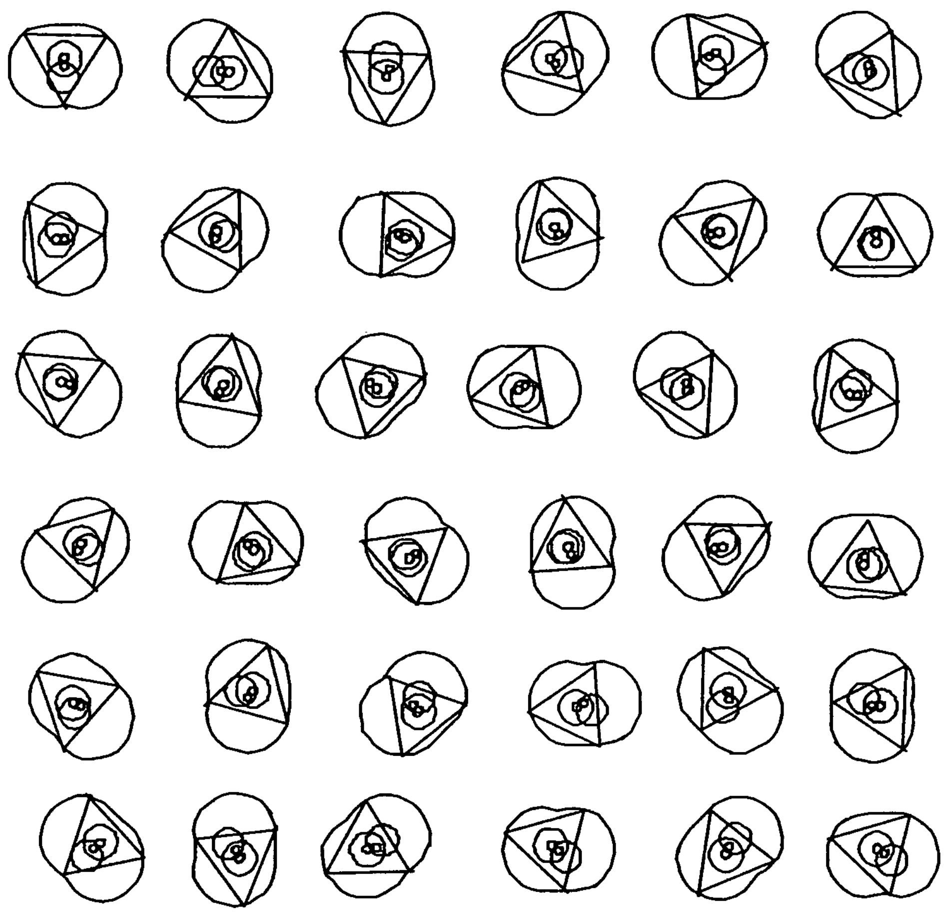
Fig. 9 (fig. 1 in Brodov)



We have retraced in red the dotted lines left by Brodov, representing the starting position of the elements, and the green line representing the cylinder only with a retro rotation. We see very well that he remains just short of the original points of the piston. The movement having led the cylinder to this position is consequentially not rotational, but as prescribed by Bradov, is planetary. In fact, we will see that ***if it is by reversed planetary movement by which we have realized this operation***, we will see that the cylinder would have found its initial position.

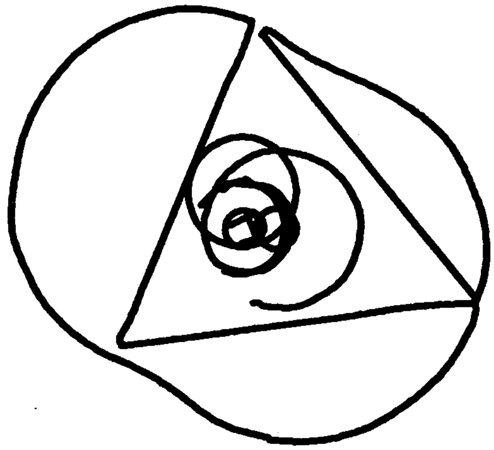
Brodov gives no kinetics for the movement of these parts. But starting from these construction elements and its comments, it is tedious, but easy to realize a strictly hypothetic example. As we will be able to observe, this kinetic sequence is only realized at fifty percent, the number of position sequences are enormous and this despite the fact that we have taken cylinder planetary ratios in the simplest manner, being of 90 degrees to 45. We will return later on the consideration relative to the relevance of application of the group of Brodov's work and to results acquired compared to Turbinary engines.

Fig. 10



As we can observe, given that we will use the same specifications as Brodov, there will always be the possibility of finding the initial figure, one, associable here to figure 9 of the sequence.

Fig. 6



We can easily observe the retro rotation of the cylinder at each of these steps, of 45 degrees for each 90 degree rotation of the eccentric. In addition, the ratios of 3 to 2 of the compressive parts have been maintained, the piston (without eccentric) is conserved, and this system of first degree liberty , the differential machine, is displaced in entirety as a group of the planetary system in which the counter rotation axle is that of the cylinder and the third, central, axle. We will see further that this is, in reality, practically unfeasible.

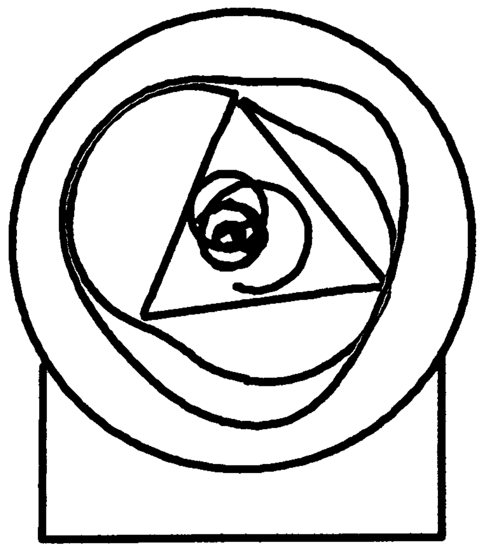
In the final figure, we clearly see the double planetary movement of the three different rotary points to which Brodov refers. It is clear that it cannot be otherwise. This is simply an autonomous differential system placed in orbit around a centre.

To properly grasp the final step of Brodov's machine, we must adequately grasp that which follows.

Up to now, we have installed, as Bradov has required, a differential system above a supposed planetary one, of which Brodov never give definition, kinetic and ratios. It is also important to note that theses differential, and supposed planetary systems are only connected between themselves by a member, being here the cylinder axle, which is rigidly connected to it.

But the elements required by Bradov to achieve the invention have not completely been realized. In fact, Bradov, advocates in this first construction and claim, that the cylindrical part of the system of first degree liberty be realized by double curvatures, interior and exterior, in such a way so that the exterior curve be inserted in a cylinder inside the machine block. But in the drawing, of figure 1, we cannot observe that. It is absolutely important to note that this last system is never completed by Brodov. The reason is the following. This completion absolutely need to be done with some other figures of the art, it is evident that Brodov look to do not know any of them. We have thus inserted the final kinetic position in a triangular cylinder, in red, which would be one of several figure that would possible complete the system, in supposing that the exterior surface would have been s the two-parted piston. This termination is not given in figures by Brodov. Many inventors do not possess the knowledge of the theoretical figures brought up by our application.

Fig. 12



But it would also have been possible to construct the machine in a way that the exterior surface of the cylinder would have been a of a square form, moving in a triangle, or of a five sides exterior cylinder. Here is absolutely no appearance that Brodov was knowing these variations, because nothing is confirming that Brodov was knowing any other figure of the art other than the triangle piston moving in a double arc cylinder, and its reversion. More than that, it is not certain that if Brodov would have had this knowledge that he would have discover the to assembly them.

In fact, Brodov stipulates, in his claim 1, that one of the elements, being here the cylinder of the first degree system, must have an "external or internal enveloping group surfaces." (Claim 1 Brodov lines 3, 4) It is properly not normal that Brodov never shows of witch group of surface he refers.

That which allows us to determine the entire construction of the first variant of the machine as demonstrated in the previous figure and is always clearly comprised of three degrees of liberty , and never realise the two divided degres of liberty of the Turbinary machine. It is also clear that the three degrees of liberty of Brodov machine are always staying incomplete and do note definite the exterior surface of the piston and the figure of the cylinder in witch it would work, and who it would be possible. It is also clear that Brodov never shoes who, not to add, but divide the time of a planetary piston, to synchronize it with a different figure of an other external ensemble, witch would be conventional.

Figure 2 : Second variant of Brodov's machine

But Brodov must have clearly noticed that, depending on the ratios used, first that the planetary motion of a piston in a cylinder may be reversed, in a way that if this piston has an interior triangular cylinder, this cylinder may be coupled to a fixed double part piston. This explain partially the figure 2 of Brodof. But Brodof also notes that a part, like the central piston of the figure 2, may be activated in

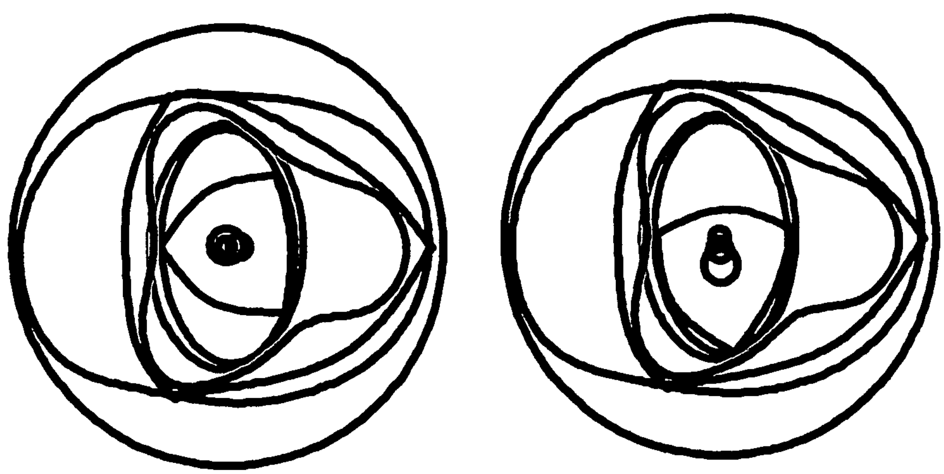
a double planetary way , and realize *in relation to an exterior observer*, **a double planetary course.** So the cylinder of this double planetary course of the piston can be similar to the fixed piston of the first ensemble describe before.

We have described this typical double planetary course ourselves since we have realized it with apparatuses other than those used by Brodov. When motivated in a double planetary manner, the piston realizes **either an oval or an elongated ellipse**, being a **ballooned** cylinder. We have obtained this type of ballooned or elongated ellipse cylinder by the superposition of crankshafts supporting a piston, in which each of these pistons being provided with an induction, or by simple induction using polycammed gears.

It is by noticing this specific course of the piston in relation to the exterior that Brodov can **rigidly attach to the centre of the machine** the double curved cylinder of the previous figure. It is therefore very important to note that the double-curved cylinder (with interior and exterior curves) of figure 2 is fixed, and that its specific curve is only possible by the double layered action of the interior piston and that it's *specific shape* has been obtained by the double planetarisation which we have mentioned above, however this time, of the exterior element, being the first level planetary support.

We have added the second rotation phase of such a machine to adequately demonstrate the evolution of Bradov's three rotation axles of different heights. We can see that, at the second phase of movement, the support members, folded onto themselves at the previous figure (reiterated at left) are in open position.

Fig. 13



It is important to note here that that which differentiates figure 1 from figure 2 is that the, so to say, two planetary set are synchronized in such a way one is working from the exterior towards the interior, and in addition, and the second from the interior to the exterior. These two planetary sets becomes so in relation to a central rigid part, acting on each of its sides as piton and cylinder. In figure 1, it's the supposed rigid exterior cylinder (which Brodov had not prove and illustrated) which will receive this

new shape, whereas in figure 2, this new form is so towards the rigid cylinder at the centre of the machine.

Brodov's figure 2 is then easy enough to understand. A more voluminous piston, provided with an interior cylinder is planetarily inserted in the exterior fixed cylinder of the machine, in such a way so that its interior surface will be the home of the cylinder in relation to the exterior surface of the interior fixed cylinder, which will become itself, in its one interior, the location of the double planetary piston. Mechanically, and since the interior piston is supported by a superposition of eccentrics, we will note that the eccentric of the exterior piston will also serve as first level crankshaft to the layered structure supporting the interior piston.

We therefore still have in Bradov's work, not only two interconnected cylinder structures, with one of the compressive parts being a double piston and cylinder, each comprising its mechanical structure, these structures also being interconnected, but in addition, one of these structures is also always of one degree of rotational liberty higher. As we shall see, these organisational "super-groups" are not only unrealizable but also, even if they were, would conserve the same ratios and would not lead to any more energetic output.

But as we are obliged to note that at Bradov's figure 1, there are many surfaces, many support axles and many machine degrees. Bradov 10 states "Three pair of conjured surfaces."

It is absolutely important also to note here, that Brodov is organizing around a fixed double face part, and exterior ensemble witch will be planetary, and an interior one , witch will be in a double planetary motion, and , that he never coordinate to dynamic part together directly. It has to be noted that , contrarily to the first level of Turbinary Machines, absolutely no part in that system does realise a simple rotary motion. So it means that Brodov, in its figure 2 and like its figure one, never realise a division of time of the piston part that will on one side modify the ratio of planetary movement of the piston and on the other side, pull a rotational movement of the cylinder, and continue to realise a machine of a second degree of liberty . It is also evident that the elevation of degres of the Brodov machine is the result of addition of ensemble that are not divided ensemble, and that Brodov never raise the degree of a partial planetary-translational movement, like we are doing it in Turbinary machines.

Additional Discussion of the Brodov's engine

Additional discussion of variant 1

The first remark relative to the first version of the Brodov engine is to the effect that when a figure can be schematically realized, ***this in no way means that it could be mechanically realized.***

The most obvious example of this is that of conventional piston engines, in which if we would have to mechanise the piston in such a way so that it realizes its movement without a cylinder, we would have to use an important amount of gears to correctly lead the connecting rod. Thus cylinders of rotary engines are much more volatile than standard engines and they absolutely require the prescribed mechanisations.

In the present case, Bradov indicates that the mechanics governing the interrelation of the first degree system are conventional as well as those governing the planetary movement of the axle of one of these systems. We will see that this is false, simply because a sub system cannot have the same figuration that the upper system, so inevitably, on of the two system will have to modify rations.

Mechanical problems

At the beginning of the demonstration we have shown that it would be possible to install a planetary sub-system on one rotary part rotating peripherally around a centre. We have also mentioned that this system could have also been installed around a central part itself being articulated in a planetary way around a centre. In both these cases, a mechanical synchronisation organ could have been made between these two systems.

But such is not Bradov's solution. For Bradov, there exists no intermediary member between the entire sub-system and the engine body. For Bradov, we must grasp one of the elements of the system to make it realize a planetary movement around an axle. This is necessary, since Bradov intends to simultaneously use the exterior curve of this element as piston of an exterior grouping.

To be brief, let us say that the movement of this piston must also be a layered planetary movement, which Brodov never demonstrates for this figure. We think that the reason of this is that , in that case, the exterior figure has to be of an other one that the interior one, and Bradov does not seem to know any other figure of the art that the one of commercial trochaic piston in a double arc cylinder. Thus, if a double planetary movement had been implied to the piston, the shape of the cylinder in figure 1 would have been elliptical, or triangular, which has not been realized either. But in addition, the members of the inferior cylinder eccentrics of first degree and the one of the piston of planetary degrees would have had to be connected by a semi-transmittive induction synchronisation, which has not been done either.

Finally, the exterior part of the double-curved compressive part, realizing an exterior piston, would have had to be introduced to different forms of retro or post rotary type cylinder, definite in function of the ratios of the inferior planetary movement. Nothing of this is definite by Brodov.

In addition, to realize a functional machine, Bradov would have had to simultaneously control, and this from the engine body, either the piston or either the piston's axle, which has obviously not been done, since he thought the internal action of one of these systems would lead an interaction on one of the others.

That which follows is therefore extremely important: Bradov doesn't expose either the mechanical means of the planetary differential system and the synchronisation mechanics of the two systems. For him, when one of the two systems would become active, it will necessarily lead to contradictory activity which is not synchronised at the level of the figures of the cylinder of the second system. That is false.

Thermodynamic problems

It is obvious that the proceeding foreseen by Bradov is simply to think that, under the effect of realization of the planetary movement of the cylinder, the piston will be put to work inversely. *Thus, in such a setup, as proposed by Bradov, if we can continue to connect the piston and the cylinder by a pair of gears, we can in no way realize a fixed axle of rotation of the piston in relation to that of the cylinder, which makes the articulation of the differential sub-system impracticable.*

There is however more. By supposing that this could have been realized, we would still have no link between the differential and planetary systems, and this because we find no anchor, or support points allowing the gears to work against each other.

Consequentially, no exterior energy could lead the interior parts, and inversely, no displacement of the interior parts would lead to a movement of the main system.

In fact, to pivot an object around an axle inside a train has no effect on its course, and its continued course has no pivoting effect on this object.

In fact, we will notice that if we realize a resistance on the exit axle of the Brodov machine, and simultaneously produce a push between the elements of the first degree system, we will be acting exactly as if we had blocked the action of the cylinder and we will find ourselves with a fixed cylinder dynamic, where the piston realises both machine degrees, and consequentially realizes a planetary movement around the cylinder's axle, without producing any activity on the central axle.

Let us now suppose the opposite, being that we have produced a resistance between the piston and the first level cylinder, a resistance which would come to be, for example, during the compression phase.

We will notice that when there is such a resistance, and that consequentially the interior elements of the first level system have been stopped, the whole system thus gravitates in a planetary way around the central axle, and in a rotary manner around the connecting axle, connected here to the cylinder.

We thus clearly see that the machine in figure and claim 1 in Brodov's work is not only incomplete , but is also dysfunctional in producing any energy whatsoever.

Brodov's machine has not been correctly or entirely mechanised. If it would have been, it would have revealed contradictions in the compression group kinetics, being retro and post rotary kinetics, and would have revealed a machine with an interior cylinder of second degree, which does not correspond to the cylinder presented by Brodov.

In addition, it would have required the realization of a first degree induction, of a double degree induction, and a synchronisation induction for these inductions, for a total, if it would have been so created, of five degrees of mechanical rotary mean and of two compressive parts.

All this to end up, even if the machine had had no conception error in this regards, in conserving the same problematic gear ratios of conventional machines.

In summary, the machine, in its first variation, in kinetic analysis, totally un complete, and in mechanic analysis, does not seem to receive or give energy, and if it does so, it cannot produce more than a first degree machine per explosion, which, as we have demonstrated in the analysis of Wankel's work, decreases the power and increases the bad thermodynamic effects.

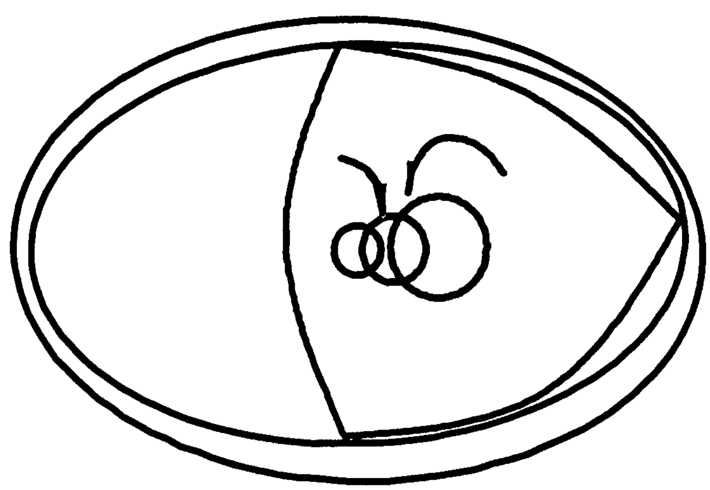
Also, this machine always got several and exaggerates degrees of liberty, on only of the compressive parts, but also of the mechanics.

<u>Additional discussion of variant 2</u>

In addition to the kinetic remarks that we made earlier about the variation 2 on the Brodov's invention, we have to submit some difficulties relatives to the mechanical aspect.

Mechanically, the main deficiency of the interior piston group of the cylinder will be that to realize such a curve similar to an elliptic cylinder, the complicity in opposite movement of the master and subsidiary crankshafts is necessary to lead the piston. In that kind of arrangement, the fact is that during the beginning of descent, an exacerbated rotation of the piston is necessary to correspond to the cylinder curvature. To arrive to produce that curve, the crankshaft will have to produce a contrary motion one against the other, and that will result, at the explosi0on and at the beginning of the expansion, in a *stoppage of the mechanical process*. The thermodynamic is thus on certain points disadvantaged, which the following figure represents.

a) Fig.: 14



Summary of both of Bradov's variants

Both of Brodov's variants attempt to overcome Wankle's inherent mechanical and kinetic problems by increasing the rotary degree not only of the mechanical instances of the machines, but also each of them remaining accompanied by its compressive parts, which greatly limits the possibility of realization, Brodov does not seem to know the figurative variants of rotary machines.

The various problems connected to Brodov variants are the following:

1) Incompletion of realisation of the invention (parts and kinetic demonstration)
2) A technical impossibility of realizing the invention
3) A very deficient thermodynamic
4) Very contingent realizations
5) An increased lack of balance of the parts
6) The impossibility of floating rings
7) An increased instability of the pistons
8) An increase, by the exacerbation of the shape of the cylinder being translated into a more pronounced transfer of courses, leading as well to more pronounced emphasises in speed of the piston on one of their sides and stoppages in speed, which are more characteristic of the opposite side, these speed reductions being created by the mechanics which, acting even more so than in original versions, braking of the thermodynamic push which is transformed into friction, increasing the difficulties in machine segmentation.
9) An excessive number of degrees of compressive parts when the calculation of the machine degrees is not done according to the inventor's disclosed mechanics, but those which would have effectively been necessary to realize, comprised of the compressive parts and the machine. In the current case, we would thus have:

- A mechanic of planetary govern of the cylinder
- A mechanic of internal govern of piston and cylinder
- Two mechanics to govern the piston bloc which would have increased the machine from one different rotation point than all the others

Detailed critique of the two Bradov variants

Technical impossibility of the realization of the invention

The schematic cuts of an engine as complex as Bradov's often mask the major technical impossibilities which make the machine practically technically unrealizable.

This is the case of both of Bradov's main variants

In the case of variant 1, we set the first level cylinder up in a planetary manner inside the bloc of a machine. We then introduce in this cylinder, in a way to produce an intern differential machine, a complementary part taking the form of a piston. Then, we produce a piston form outside of the cylinder and a cylinder, not illustrate and prove by Brodov, to receive it inside the engine bloc.

The first difficulty of this set up is to say that it is not possible, with only Bradov's specifications, of defining the form of the machine bloc cylinder since, from our experience we know which would necessarily be, if the exterior part of the cylinder is playing the role of a piston of similar shape, which Bradov requires to be either retro rotary triangular cylinder, or post rotary single arc cylinder. It is obvious that it would have been relevant that Bradov have given us this information because it is obvious that different machine forms lead to different gear ratios, which in turn produce retro rotation ratios. But, we also know that the exterior shape of the piston cans realise another figure, according to different other figures of cylinder, what is never demonstrate by Brodov.

For example, Brodov could have bypassed the directional problem by modifying the exterior shape of the planetary cylinder, making it pass from two sides to, for example, three sides, which would have allowed it to be introduced in a double arched bloc cylinder, keeping the superior system post rotary. Bradov could have also employed another post rotary figure, such as a square piston moving in a triangular cylinder, which would have conserved the type of piston counter rotation as post rotary. But to do that, it would have necessary to Brodov to divide and modify the planarity sub system. But in its conception this sub system is a differential one, and is partial non only autonomous, but also keep the same ratio gear in the art. However, Brodov did not seem to know these eventualities, and theses eventualities are only possible if the first systems has , like in Turbinary engines , different ratios than the standard one.

Already at this stage, Brodov's machine is incomplete and unrealizable.

But let us suppose that it had been realized according to these figures.

The cylinder would have received its eccentric, which cannot cross the machine, as well as the other elements which will come. The mechanic of the planetary cylinder could have been constituted, since it is here of retro rotary type, in mono induction with an external type induction gear set up rigidly on the side of the cylinder and of a support gear set up in the side of the bloc.

Therefore, by supposing this form of the exterior compressive parts and this mechanic, it would be functional here, however we must still find means of assuring a better seated range of the axle on the same side of the engine.

Brodov does not foresee that the piston incorporated to the cylinder of this double curve would be mechanically connected by non conventional means. This supposes that, still in mono induction, two major elements being minimally a support gear and an induction gear. Since Bradov maintains that this sub-system will be of first degree, that it will be the differential system, these gears being respectively set up on the cylinder and the piston, which will be coupled to each other.

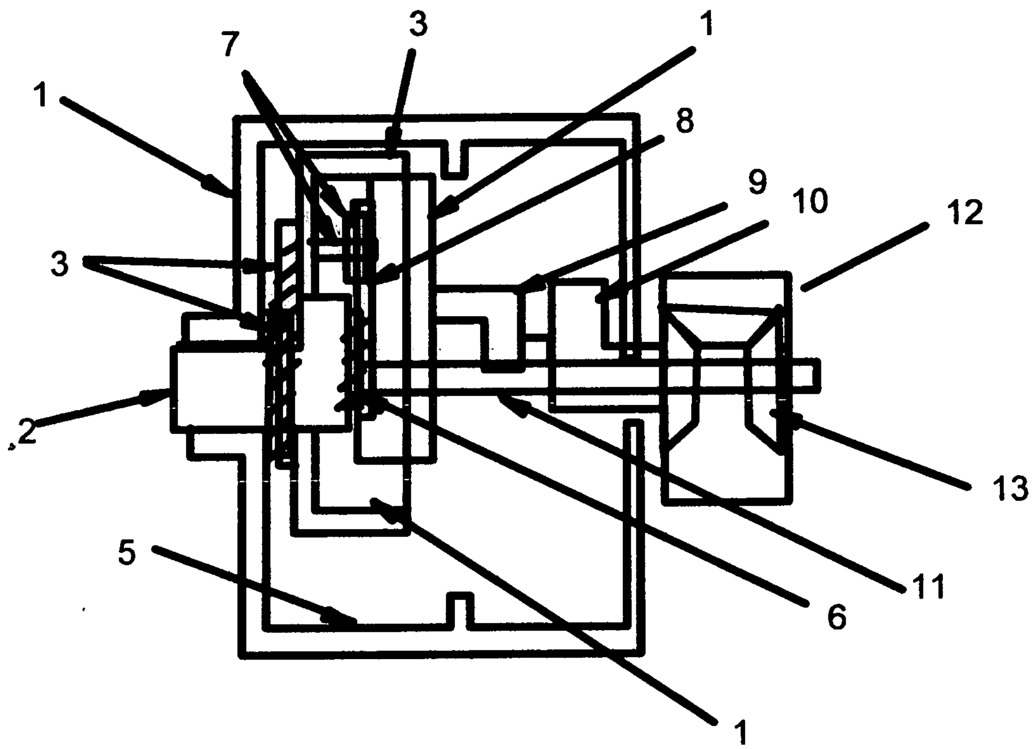
Therefore, to be activated between themselves, and according to an exterior part, the bloc of the engine and the two gears must possess either:

- two fixed points around which they will rotate (differential procedure)
- or a single fixed point, but only one of the two gears being fixed (being the planetary procedure)

Even here, since we know how to realize this eventuality, we will ourselves complete Brodov's system, by however underlining that this is only realized in the goal of clarifying the current commentary, and that this is in no way part of Brodov's work.

To do this, we would have to realize a) a support gear which is no longer set up in the side of the cylinder or in the engine bloc, but rather set up on the crankshaft's eccentric and couple this gear to an intermediary gear located on an axle set up rigidly in the side of the cylinder. We'll thus obtain a rotation of this final gear which we could then connect to the induction gear of the piston.

Fig. 15



1) Engine body and internal piston
2) Axle of the central eccentric
3) Support mechanic for the planetary cylinder and cylinder/piston
4) Exterior fixed cylinder
5) Dynamic support axle of the central axle
6) Intermediate axle and gear
7) Induction gear of the interior piston
8) Subsidiary crankshaft of the interior piston
9) Master induction crankshaft of the interior piston
10) Coordination semitransmission of the two main inductions

However this procedure is not complete. In fact, in analysis, we will realize that the centre of the piston is not supported. It is obvious that it cannot be held by the cylinder which is in rotation, nor can it be held by an axle located on the engine body. We however know that it must always keep an equal distance in relation to the cylinder axle. Thus the cylinder turns. Consequentially, the centre of the piston must rotate around the centre of the cylinder axle to be able to realize this internal rotation. We can therefore imagine that a member could be liberally installed from a central axle of the cylinder, this member finishing by an axle which can support the piston. This member will allow the piston to remain at the same distance of the centre of the cylinder. But the position of the piston would not be completely secure.

A complete solution would consist in stating that if the centre of the piston realizes in periphery around the centre of the cylinder, imitating a planetary dynamic, we could realize an element turning around its centre, this element which will receive a second planetary element, this second element comprised of an axle supporting the centre of the cylinder. Even with this work done, we would still not be done supporting the interior piston and cylinder elements, planetary and peripheral to the centre. We would still have to connect the eccentric and the new axle supporting the piston.

We now see the incredible difficulty of supporting the central elements and lubricating their complex supports.

The group would comprise on each side two planetary systems as well as an internal planetary ligature system. Thus, five degrees of rotational liberty.

As we can note, Brodov's induction was far from being complete, which we had to do, and which puts non conventional elements into play to which Brodov's text could not reference, for example, layered mono inductions, axle semi transmission, inductions by dynamic support gears, as well as using a triangular cylinder shape.

This exercise has not been in vain. It has made obvious, by its high number of degrees of liberty, **the exaggerated complexity of Brodov's machine and its industrially unrealizable character.**

It is useless to say that given the minimal degree of flexibility of any coupling of gears that no gear in the world could assure the security of the elements of the Brodov's machine. The number of gears will be, if fact very to high to insure the precision of working of the machine.

Or even, it would require that the axle of the planetary system's eccentric of the exterior cylinder be deep, which would allow a fixed member to cross it and allowing it to receive a fixed support gear allowing to connect the piston directly or indirectly.

Let us remind that an inventor cannot allow himself to not describe the essential elements to his invention with the exception that these elements are part of the current standard. Thus, both of the proceedings here are in no way taken from work previous to Brodov.

In addition, the motivation of the interior piston to the double arched cylinder could have also been realized by independent mechanical inductions. But, in these cases, layered inductions would have

been necessary. They would have accompanied the cylinder of a characteristic form. The double curved cylinders could have then taken the character of the fixed interior cylinder of Bradov's second variation, which is in no way the case for the first variant.

Thus, the mechanics which we have fabricated to articulate Bradov's system are not corroborated by the cylinder's figure.

This means that the increase of degrees unrealized by Bradov in the first variant is simply an increase of degrees of the pairs of compressive parts, but also, whether or not they had been presented, of the mechanical parts. In addition, the absence of determination of the exterior figure is equivalent to the absence of determination of the ratios of the planetary movement of the double curved piston cylinder. So mechanical ratios stay undetermined, what is extremely problematic, when we clearly know that ratios are entirely modify the thermodynamic of the machine.

Thus, without our contribution, it remains impossible, in Brodov's first variant, starting only from existing elements in art of rotary machines as well as those which Bradov has described, to realize a support axle from the centre piston of the interior piston and impossible to realize an orientation of the mechanical induction of it. As all geometry has its mechanical corollary and vice versa, this signifies that the two systems will remain separate and could not produce any transfer of energy to the other. The engine of variant 1 is, pure and simple, not functional mechanically, figuratively and thermodynamically.

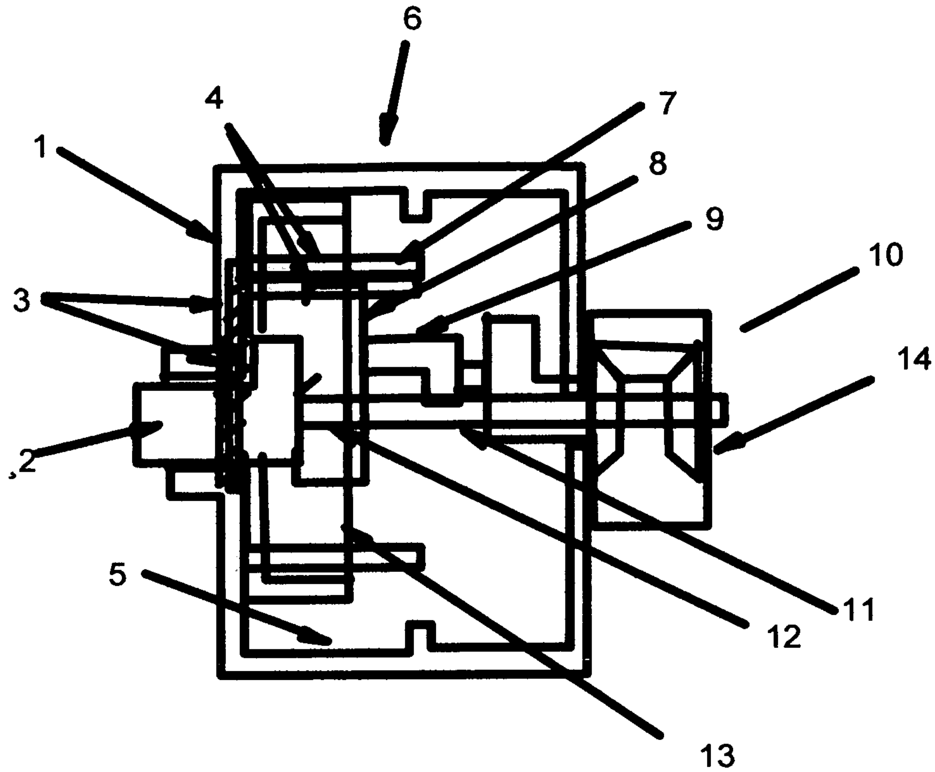
Detailed critique of Brodov's second variant

The second version of Brodov's machines is, also relatively to the technical realization, extremely problematic and unrealizable. We can only see this, as before, when we reconstitute this machine, which we shall do here.

In the second version of Brodov's machines, we must firstly set up a **cylinder rigidly inside the center of a machine bloc, which we shall name exterior shape.**

We will then set up in the centre of this cylinder, a second cylinder, specific in that it possesses an interior and exterior double curve, which we shall call double curve cylinder.

Fig. 16



Coupe fig 2

1) Engine body
2) Exterior compressive part eccentric
3) Exterior compressive part induction
4) Interior piston/cylinder surfaces, fixed rigidly to the bloc
5) Exterior group cylinder
6) Exterior group piston
7) Fixed central piston/cylinder
8) Interior group double planetary piston
9) Subsidiary crankshaft of the double planetary induction
10) Semi transmission
11) Master crankshaft of the double planetary induction
12) Link axle of these two inductions
13) Interior group cylinder
14) Synchronisation gears

A piston will then be set up in a planetary way around this double curve cylinder and inside the exterior cylinder, comprised of an extrusion which is also shaped as a cylinder.

Up to here, the system remains feasible.

But we must now set up the interior of the double curve cylinder to another piston.

Up to here, since the elements still don't have any dynamic, we can always set one up into the other without counter effects.

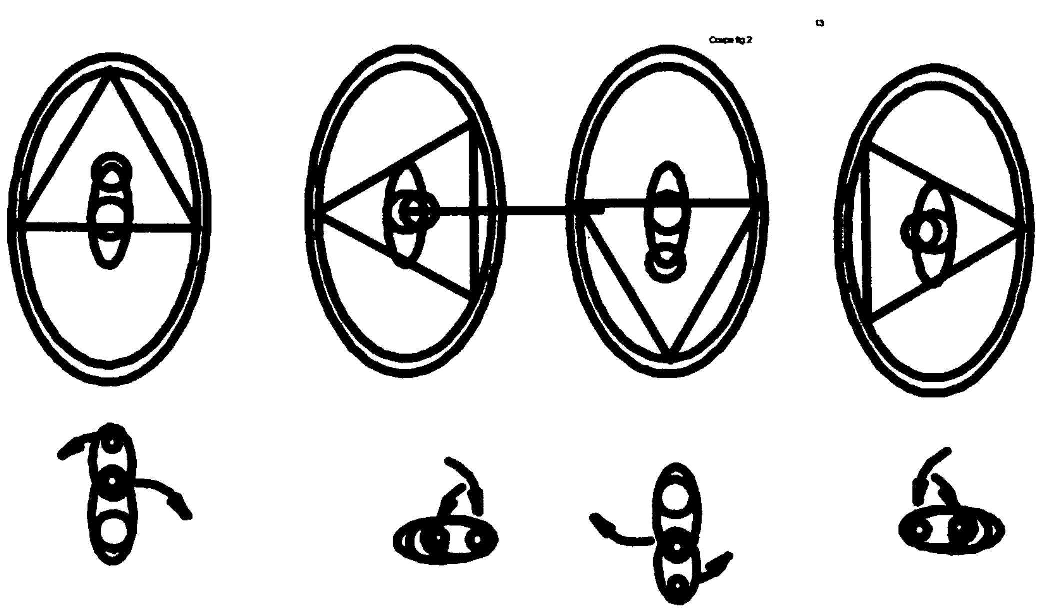
However, the whole must be dynamic and produce energy and output, and to do this, must be totally mechanised. From the start, the mechanic allowing the planetary control of the exterior or peripheral piston will be difficult enough to realize with a standard mono induction.

In addition, we could also install it, according to figure 2, in a side of the piston of the subsidiary crankshaft supporting the central piston.

Let us open a bracket here, which Brodov does not comment on and is not part of art standards.

If we reconstitute the movement of the interior piston of figure 2, we can state that its center produces a movement witch is near to rectilinear, and that in alternatively opposed directions.

Fig. 17



This movement can only be obtained by the work in opposite directions of two crankshafts of equal length. But at this stage, this eventuality would comprise a certain level of illogic and incoherence. In fact, a more voluminous suspension would activate a smaller set, which is contradictory and has no mechanical sense.

But let us suppose that this works, when all the parts are activated manually. They must still be able to be realized in a sufficiently achieved manner so that the action of one of the compressive parts would lead the complete system, whether it be in explosion or compression.

Thus to do this, we must absolutely realize an orientational mechanical control of the crankshafts which are subsidiary here, or of a central eccentric which would eventually be set up in the central piston and mounted on the central axle of the piston, or the rotation axle of the eccentric's piston.

Thus, once again, there is an obvious absence of the set up of gears necessary to this effect since they would simply not have the capacity to be anchored or armed to the bloc, which is absolutely necessary.

Both of the previous ways used could be effective here, but they are not presented by Bradov.

There is also a final, no less important, element missing. In fact, we would have thus controlled the movement of the subsidiary crankshafts, but we would not have countered the counter rotation movement of the piston on itself.

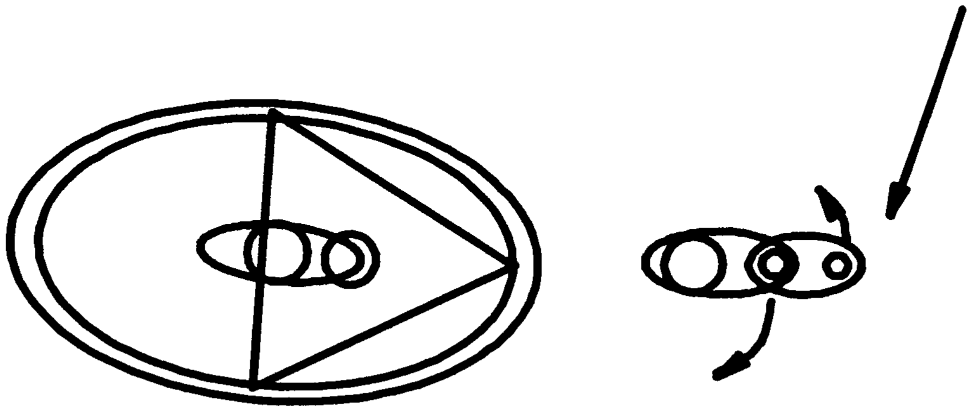
Thus, as we can see, this movement is exacerbated to the extremities and cannot be produced by itself or by means of the cylinder.

Without this control, the machine would definitely be blocked at the end of each cylinder.

One more thing must be said. The forms of the machine literally force Brodov to realize a flattened out, almost rectilinear, elliptical movement of the piston, whereas according to our own works, it could be that of a less pronounced elliptical shape.

This almost rectilinear course also leads to contradictory push problems since at the end of the compression the push on the piston goes in opposite direction than the action of the subsidiary crankshaft, **which destroys the capacity of the machine**, which can, however, when it possesses all of these mechanical elements, which is far from being the case, could still not be used as a compressor and remains difficultly marketable.

Fig. 18



Consequentially, the central part of the machine could eventually be used as a compressor, but never as an engine, since it produces a rotation in opposite direction of the push.

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A non functional thermodynamic

There are therefore major technical impossibilities which prevent the functioning of the machine. The systems cannot be synchronised once the mechanics have been achieved. Therefore, in the current scenario, Bradov indicates that the mechanics governing the interrelation of the first degree systems are conventional, as well as that which governs the planetary motion of the axle of one of these systems.

Here is what is essential : Bradov does not expose the synchronisation mechanics of these two systems. For him, when one of the two systems will become active, it will necessarily lead to the activity of the second system, which is false.

In fact, we will note that if we realise a resistance on the exit axle of Bradov's machine and that simultaneously we produce a push between the elements of the first degree system, we will be acting exactly as if we had blocked the action of the cylinder and we will find ourselves in a fixed cylinder dynamic, where the piston realizes the two degrees of the machine and consequentially realizes a planetary movement around the cylinder axle without producing any activity on the central axle.

Let us now suppose the opposite, being that we have rather produced resistance between the first level piston and cylinder, a resistance which would occur, for example, during the compression phase.

We can see that when there is such a resistance, and consequentially, the interior elements of the first level system are stopped, the whole system then gravitates planetary way around the central axle and in a rotational way around the connecting axle, in this case, connecting the cylinder.

Thus, we clearly see that Brodov's machine is deficient in realizing any energy whatsoever.

For it to have been functional, Brodov would have had to simultaneously control, starting from the engine body, either the piston or either the piston's axle, which he has obviously not done, since he thought the internal action of one of these systems would lead to an internal action on the other.

But pivoting of an object around an axle inside a train has no effect on its course and its continued course has no effect on this pivoting.

In the case of the first figure, even if this could be done, as we have done here, but let us repeat that it had not been done by Brodov, the internal ratios of the first degree system of liberty would remain of 3/2 and consequentially that this machine would not realize any more power than standard machines. However, there is more

2) Very limited realizations

We have demonstrated in our previous works that it is possible to realise an increase of mechanical degrees of a compressive part without the contribution of a second compressive part, and by doing so, the lengths of the crankshafts would be variable and would lead to variable displacement figures of the cylinder and piston. Here, the coupling of these systems leads to limited realizations such as the rectilinear kinetic which is irrelevant to rotary systems.

3) An increased unbalancing of the parts
In such an assembly, very heavy parts will go in all directions and it will be nearly impossible to realize a correct balance

4) An impossibility of floating rings
As we have noticed, the absence of all the required mechanics will force the course of the cylinder to allow the realization of cycles since the pistons and cylinder will themselves participate to the mechanical action, so floating rings will be impossible in many groups.

5) An increased instability of the pistons
6) An increase, by the exacerbation of the shape of the cylinders being translated into a more pronounced transfer of course, leading to more pronounced accentuations of speed of the pistons on one of their sides and these speed stoppages more characteristic of the other side, these stoppages being due to the mechanics which, acting even stronger than in initial versions, braking of the thermodynamic push and being transformed into friction, increasing the rings difficulties of these machines.
7) An excessive number of compressive part degrees. In the measure where the calculation of machine degrees cannot be done according to the mechanics disclosed by the inventor, but those which would have effectively been necessary to realize, comprised here of the compressive parts of the machine. The current case would therefore be comprised of:

- A planetary mechanical govern of the cylinder
- An internal mechanical govern of the piston and cylinder
- Two piston bloc govern mechanics, which would have increased the machine from a rotation point which was different from all others

It is obvious that if the realization of a single level of these machines would be difficult, we can only imagine the complexity of these two groups allowing the realization of an engine.

Any Bradov machine remains unapt to modify the balance ratios on the piston by centralizing the thermodynamic receptiveness, because none of these methods modifies the ratios of correlative gears to the ratio of 3/2 material cylinders by producing an exacerbation.

In the case of the system in figure 1, we note that if the system would have been functional that it would have produced an increase in compressions and explosions but that these explosions remain connected to the first degree system, thus conserving the exact same conventional rotation ratios, and consequentially, since the second system possesses no eccentric, the same thermodynamic difficulties as first degree Wankel machines are produced for each explosion, which are even less profitable than currently industrialized machines. Brodov's solution is therefore difficultly realizable.

In addition, pistons of rotary engines are already extremely heavy and it seems unthinkable that a complete piston and cylinder structure be put into planetary movement without increasing bad balance of the engine to its highest degree. It is obvious that the parts and gears could not support such displacements in mass.

We see very well that Brodov does not arrive to kind of division of movement like in Turbinary Engines, but also does not produce any kinetic whatsoever leading a contrary orientation of the central parts and second systems, or of one part of the second system, but also, for him, the parts must go in the same direction, which would only give an additional differential force.

Let us note that even if Brodov would have completely mechanised the system of figure 1, or even if he would have freed the system from his figure 2, the piston gear ratios still remain unchanged (3/2), which corrects in no way the kinetics of the machine, which we have also noted in our degree elevations, except for that by polycammed gears.

In addition, as we have seen with the kinetics reproduced above, the complexity of the correct control of subsidiary parts will be extremely difficult to control. In fact, gas intake and electrical components in such groups, as well as cooling of the bloc, will be an enormous task for motorists.

The elevation of degrees in figure 2 poses problems. In fact, instead of articulating a first degree group in planetary periphery to a centre, here, it is an exterior planetary movement, in which the orientation is induced by the exterior curve of the central fixed cylinder, folding on a double central planetary. The double planetary motion of the piston is done by a twofold action of the exterior parts, being by the planetary piston set up in an exterior rigid cylinder, completed by a second system supporting the interior piston, which has also been introduced in a fixed cylinder, the exterior part of this cylinder.

The exterior part of the cylinder could not serve as a fixed piston on the exterior part because rings could not be set up at a location which will always touch the piston.

We thus see that Brodov has simply attempted to realize, peripherally and planetary way, a set of elements realising an interior planetary dynamic. The project, being that of realizing elaborations of machines and of rotary sub-machines, is easy to grasp, but simultaneously complex to realize, and all this to finally offer few results in relation, in counterpart of many counter results, and this without counting the eventual realization efforts.

Fundamental differences between Turbinary engines and the Brodov's engine

The differences between the Turbinary engine and the Brodov's engine are numerous, important and major.

The most fundamental consists in the completely opposite direction of both of these techniques, relative to the treatment of rotary machine degrees.

Whereas Brodov simultaneously increases the number of degrees not only of the layered axle rotation mechanics, but also of compressive parts, the Turbinary engine proceeds rather by division of the degree of a planetary machine to then distribute this division between the remaining divided planetary part and the circular movement of the new active part. The increase of degrees thus realized are still an increase in degrees of the divided parts, or even of the new active rotary part, and thus are able to realize many new gear ratios and positive balancing of the pushes implied by Turbinary engines.

In fact, we can see that even basic Brodov machines comprise at least four degrees of rotation in different locations whereas Turbinary machines are more effective and have only two.

In fact, whereas Brodov had attempted to correct conventional engines by increasing the number of degrees of conventional machines by simply adding them, not only mechanically, but also on the level of their compressive parts, by layering, and to the contrary, the essence of the Turbinary engine is to divide the levels of rotation and, after this division is done, to realize the planetary part with a remaining part of this division, and from here to confer to the cylindrical part a part of this division. In addition, this division has been established according to exact gear ratios of the poly induction support mechanic, this kind of division being unknown by Brodov.. Consequentially, the exact quantum of the division of the movement of the piston, being equal to the speed of the master crankshaft, is this speed which has been attributed to the cylinder. In addition, the new ratios of the divided planetary movement is clearly described, and is putted in relation to a specific figure relative to the bloc. So when, in Turbinary machines, the cylinder is acting simultaneously as a piston of an external figure, the Movement figure, witch is the figure in relation to the bloc, can by the cylindrical fixed figure, clearly described by us. Brodov cannot pretend to these aspect.

Consequentially, at the level of the axles of rotation with no elevations, but however, the creation of an additional rotation of the same axle, this rotation being mechanised by inversed, accelerative or accelerative/inversive semi transmission, these kind of mean being totally out of area of Brodov..

These observations allow us to realize new machine kinetics requiring no supplementary material cylinder, however, introducing new geometric parameters, which themselves lead to new gear ratios, allowing an improved balancing of the reception of the explosion by the pistons.

There is therefore no common measure between the direction of research undertaken by Brodov and ourselves.

Turbinary machines and increase in rotational levels

It is important to understand that it is after abundant work on our own versions of machines with increased rotational degrees, and having realized their technical difficulties in commercial realization that we have come to the idea that machines should find some horizontal, as opposed to vertical, versatility. However, this does not prevent Turbinary machines to be increased in rotational level. But the increase of one of the levels of the parts is always an increase of the rotational level of one part to which has been attributed a partial rotational, issued from the previous division.

In this, any increase in rotational levels of Turbinary machines respects the ratios of Turbinary machines and can, in addition, be realized by our own means, due to Bradov's seeming difficultly realizable and very limited.

In addition, relatively to the notion of increasing rotational degrees, we can also add a final point. We have demonstrated that in our previous works and in the current work that the increase of rotational degrees is an increase in the degrees of the mechanical structures of different centers governing a same piston and that it can and must be realized without doubling its compressive parts to find the best cylinder forms possible.

In addition, it is obvious here that, since the forms of figures of movement of the pistons are identical to those of material cylinders, that we could, from a single induction, govern a piston of either same or different shape, depending on the case, which could be inserted in a material cylinder having the same shape as the form of the piston movement. In these cases, we must necessarily calibrate the size of the cylinder and the pistons in function of the length of the eccentrics, depending on if we want to conserve it or if we want to produce different effects.

As a first example, a doubled triangular piston could realize a retro rotary shape of a simply planetary material cylinder group of four sides and be simultaneously activated in a Turbinary group of a double arched material cylinder, and that , when the geometrical figure has also four sides. This is perfectly logic, because , effectively , Turbinary engine prove that a piston may realise a form ein relation with the cylinder , different form a specific form in relation to the bloc.

Or even, a doubled piston of six and three sides could simultaneously by activated in a simply planetary manner inside a five sided cylinder, and Turbinary in a double arched cylinder, realizing a five sided successive geometric figure.

Finally, two different figure may be synchronised by organising them in a way in witch they will realise the same movement and geometrical figure. These doubling of compressive parts would therefore not require, contrary to Brodov, as much supplementary mechanics, and in addition, which is essential, require no increase of degrees realized in height, but would remain, according to theories of the elaborated Turbinary machines, horizontal. In addition, the elaboration of cylinder forms remain the domain of Turbinary machines in the way that they respect the new fragmented kinetics and ratios of Turbinary machines. A translational machine could, for example, be realized peripherally (fig 58)

Turbinary machines and compressive groups

Turbinary machines can obviously put into play levels realizing figures of machines with N sides. But, as the pistons of these machines simultaneously realize virtual cylinder figures which are identical to the conventional material figures, and this in addition according to mechanical ratios of these virtual figures, it is obvious that a same doubled piston could simultaneously be activated in an N sided Turbinary figure, and a conventional cylinder equal to its virtual form which, once again, is not covered by Brodov's description. At its limit, this same material group could serve as orientational guide to the piston of the Turbinary machine. It's with these ends in mind that we have inserted in our claims the possible use of a Turbinary machine in combination with the synchronisation of existing machines.

This eventual possibility would allow the realization of two stroke engines, one of the levels serving as a pump and the other used for combustion.

From the same limit, the conventional cylinder piston level could simultaneously used as a device for the mechanical part, in particular, by using primitive rotary machine forms, which would be upsetting to realize the retro rotation of the piston of the Turbinary part by gears.

For all of these reasons, the results obtained by Turbinary machines are opposite to those obtained by the Brodov engine and are summarized as follows:

The four most important contributions of Turbinary engines have been to allow :

1) The calibration of a mechanical receptiveness, (retro or post mechanic) near perfectly equal receptiveness, perfectly in coordination with the different types of thermodynamic efforts which can be realized by the combustion chambers of volumetric engines
2) A better balancing of machines
3) A decrease in the number of rotations per minute
4) An increase in the number of maximal rotations per minute
5) A decrease in the number of parts
6) An increase of the number of explosions per revolution
7) A decrease in weight
8) A decrease of the number of parts

Personal note relative to our previous works

The Turbinary engine has been accepted as an invention by the Russian Federation under number RU 2 330 963 c2, and the Bradov opposition has also been examined by the PCT Canada, without being recognised as valid.

Our works previous to Brodov

We have demonstrated that it was possible to realize three levelled machines which are better supported, and in addition, to put aside Bradov's supplementary and superfluous piston/cylinder groups in the following three ways:

In 1983, in energetic motor machine, we have demonstrated how running parts could allow the realization of increased compression degrees of a machine. In 1984, in semi transmittive energetic machine, we have elaborated the exact same mechanics as those used by Bradov to activate the centre and the paddles of the energetic machine.

From a crankshaft we have realized a three levered induction, but by keeping the piston's crankpin to two levels, by elevated by means of a polycammed gear set up in the side of the engine bloc and a circular gear set up in the side of the bloc.

Our works after Brodov

In one step, we have brought conventional kinetic rotary machines many new mechanical proceedings.

As shown in Bradov's figure 2, he has been forced to pass by the axle of a crankpin's exterior conventional piston to then affix a second axle turning in opposite direction, and the crankpin of this axle consequentially supporting a piston with double layered gears allowing the realization of the double central fixed curve cylinder form.

Thus, not only is Bradov's invention incomplete, but remains very distinct from the Turbinary engine.

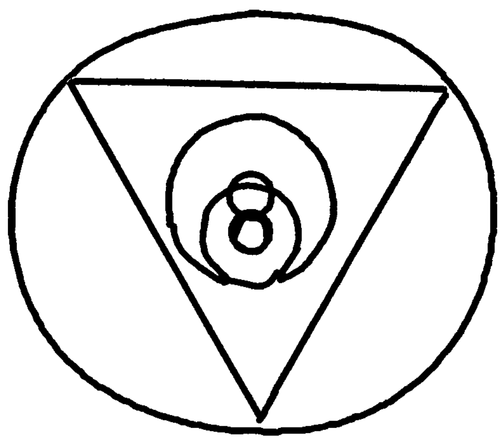
This configuration is not complete because the lengths of the eccentrics supporting the two degrees of the structure, as well as the curves of the fixed internal cylinder cannot modify each of the degrees needing to be contained in a piston cylinder group, the group above serving simultaneously as a mechanic.

But if we understand, as we have demonstrated in our previous works, that we have no need for the exterior piston and cylinder, and that we can control it by a layering of not only the piston movement, we will then understand that the lengths of the eccentrics will be freer, and that we could also realize cylinders with very different shapes than those presented by Bradov.

In addition, it is obvious here that Brodov uses a displacement in opposite direction of the superior member of the interior piston to that of the eccentric of the exterior piston, which is, once again, forced by its obligatory passage by an exterior group. This is the only opposite movement realized by a sub-part.

Therefore, without this obligatory passage, and as we have demonstrated in our previous works, both the master and subsidiary crankshafts can act in the same direction, producing rounded cylinders, rather than elliptical ones.

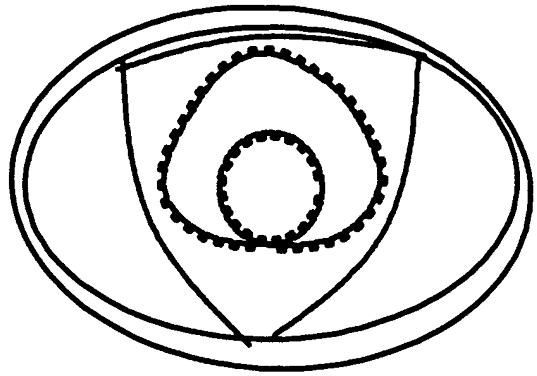
Fig: 20



To this we must also add that not only is the governing second degree mechanics not completely realized, including the required gears, but also that they remain sub-crankshaft assemblies. We have demonstrated that the layering of crankshafts can be generalized by using any first degree mechanic in complicity, for more than 200 possible mechanical variations, each of these having specific qualities and faults.

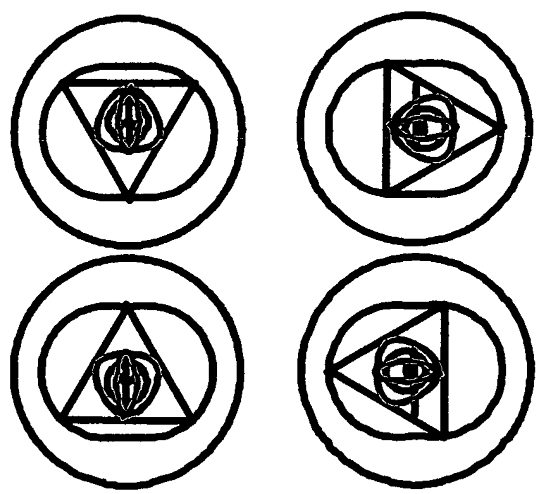
Not only has the Brodov engine been liberated from its unnecessary obligation of sub-groups of curved parts and generalized all types of inductions for these machines, but in addition, we have also demonstrated, in our previous works, that the coupling of the polycammed and round gears would allow the connection of articulated objects in a double planetary manner, directly to the bloc in a simplified manner and with a single induction.

Fig. 21



As well, in what concerns the complicity of the parts of layered movement structures, we have demonstrated that their realization could not only be more dynamic, but also according to various forms other than those proposed by Bradov. Here, there is no central fixed cylinder

Fig. 22



Consequentially, we have generalized and simplified our works of 1981 1 and 1983, and those of Bradov. But as we have noted, that even when generalized and simplified, these layered engines were not. Knowing the endurance which modern engines must possess, this is very difficultly realizable for the industry.

We have realized support and induction gears of the polcammed type. Polcammed, with a single novelty, manages to realize accelerations and decelerations of the cylinder piston which realizes three levels of liberty, but two levels mechanically.

We have remained at three levels, but by coupling a polycammed gear and a round gear, we were able to more adequately support a piston positioned in a double planetary setup on a layering of crankshafts.

Consequentially, whether it be our machines from 1981, 1983, those of Bradov, or our generalised and simplified support mechanisms for layering degrees, they all suffer from the exact same problems, which we have summarised.

Consequentially, during the creation of Turbinary engines, we were well aware of the problems inherent to layered engines, as proposed by Bradov, since we have produced some ourselves and have stated the important deficiencies as stated at the beginning of our disclosure, whereas rotary engines remain problematic, the attempts of rediscovering the rod effect by layering seems even more so, leading to the following problems:

The machine by degrees, whether it be Brodov's version or one of our own, always realizes accelerations decelerations of the piston on its axle in course of its cycle and this is what the specific forms result from – elongated or rounded cylinder forms – which does not happen in basic Turbinary machines, in which there is rather a fragmentation of the induction degrees in parts of degrees, which leads to a respect of the cylinder curves. When these machines have increased in degrees, they do so by continuing the respect of the divisions which are novel to them, consequentially never realizing the increase of degrees of Brodov's machines, which are already very high in this matter.

It does not add any levels to the machine, in terms of additional rotary axles set up one on the other. Rather, it divides one of these degrees, a level by dividing the movement on a same level.

The result is that there are still only two rotation axles in Turbinary engines, but more than one element to rotate and counter-rotate on this axle.

In the case of degree elevations of Turbinary engines, they cannot be compared to Brodov's degree elevations. Brodov elevates the degrees of a machine already possessing too many levels of rotational in terms of numbers of axles.

When we increase the degrees of the machine, we do so in respect to the interior division of a part of the same degree on a same axle, on top of this same axle, accelerative or slow down movements. The degree elevation always respects the basics of the invention and therefore do not produce any added part. In addition, when there is elevation of degrees of one or the other parts of the Turbinary machine, all while respecting its fundamental character, this is done by our own means, and we have not proposed any first level sub-system rotating around a Turbinary engine element, or even an elevation of degrees in Turbinary engines from the outside towards the inside.

It is exactly these problems which have brought us to note that the restructuring of machines did not start from an increase in degrees but rather by a division of a same degree.

In Turbinary engines, we subtract from one of the parts a component, a part of the rotational levels to attribute it to another part on the same rotary axle. Consequentially, there is a transfer, either total or partial, of the kinetics of one element to another, notably that of the master crankshaft of the poly inductions to the cylinder of Turbinary machines. For example, we subtract the master crankshaft from the poly induction to attribute it to the movement of the cylinder, and from this we subtract a quantum of rotational from the piston.

Consequentially, in basic machines, there is no increase in degrees of rotational but rather a fragmentation and division of the levels of rotational .

This division is done on the same central axle and is realized by an accelerative, opposite accelerative or opposite semi transmission, none of these elements being found in a machine in which this division has not been realized, as for example, that of Brodov.

This division leads to new planetary way ratios allowing

a) The neutralisation of negative counter-forces on the piston
b) To organise with precision, by a dynamic group, the gear ratios and type (post or retro rotary gears) allowing the precise realization of the specific mechanical receptiveness which must be constructed according to the combustion chambers used, according to the location of the spark plugs, according to the advance or delay of their lighting, and according to the anticipated development of a different type of gas.

It is obvious that Brodov's machines do not manage to modify the fundamental ratios of 3/2 gears, of Turbinary machines with trochaic piston, and double arched cylinder. Brodov nowhere alludes to any other figuration of rotary machines. It is therefore impossible to think that he (indeed, like Schwam) would have been able to modify the gear ratios according to these other machines.

Wankel (supplementary remarks)

It is evident that pistons and cylinders of subdued Wankel patent are strictly both rotary, and realize only a single place of compression. Wankel's machine does not contain any eccentric of support of the piston.

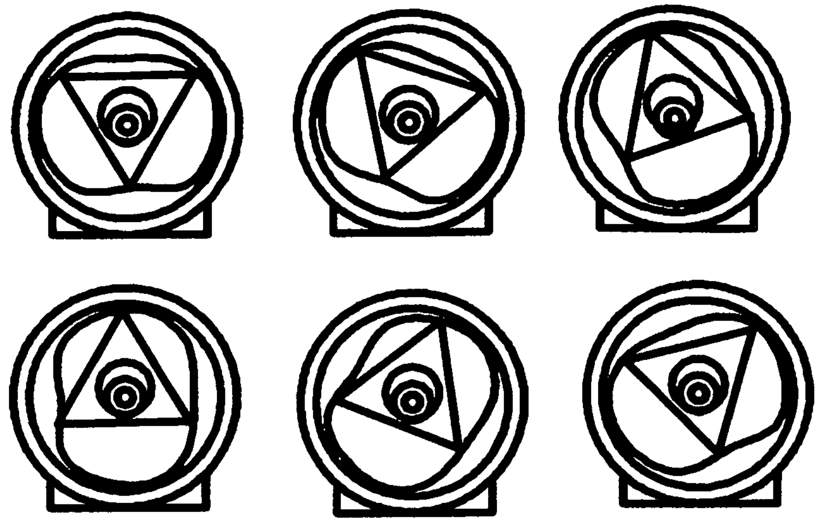
In the case of the quoted example, the degree of freedom is lowered, because none of the elements is supported by eccentric. One does not find any example of this eventuality in our description, and this eventuality does not bring progress with regard to the conventional machines. This type of kinetics modifies in no way the mechanical ratios between elements which preserves all the thermodynamics difficulties of these machines.

Besides, while the number of places of compression, in machines with fixed cylinder is equivalent to bow of the cylinder, and, in machines Turbinary s, among quoted with the piston or among quoted by the geometrical shape, what is superior to the conventional number.

Now in the given example, the kinetics is producing a single place of compression, and consequently, if one tries to establish the geometrical figure or the figure set of the compression places of such a type of machine, one will arrive clearly at the conclusion which there is has only the only one side. Besides Wankel's machine, all the points of the piston realize, as shape of movement with regard to the block, the same circle.

A single compression per eccentric rotation, which occurs in the quoted example, is a result completely contrary to the preferable result obtained with Turbinary machines

Fig.23



As we see in this Wankel kinetic, piston and cylinder are moving, but the machines has no crankshaft, piston and cylinder are supported respectively by a rigid axle fixed in the side of the bloc.

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Our demand 1 , 2 , 3 and following ones describe machines in which the points of pistons which describe either different Geometrical figure of n sides, figures which normally produce a superior number of compressions. None of our machines lowers the degree of freedom of a machine of which compressive parts are of the range of the rotary machine of the Wankel one , analysed here.

One has to notice that the shape of movement of the pistons in the case of Wankel's machine consists of what every point of the piston produces, as the Movement figure, **the same as a circle in which the centre is the centre of the piston.**

One has to notice that Wankel's kinetics produce one explosion by turn, and has no crankshaft, keeping the ratios of conventional gearings.

Besides, one must also note that it is also possible to realize a Turbinary machine which realizes also only one explosion per turn, which is not however, obviously, the most preferable and ideal realization of the invention. This version only has a theoretical value. It marks the posterior limit point of Turbinary machines, in which all elements, - cylinder, piston and eccentric - are, from the point of view of an external examiner, travelling in the same direction .

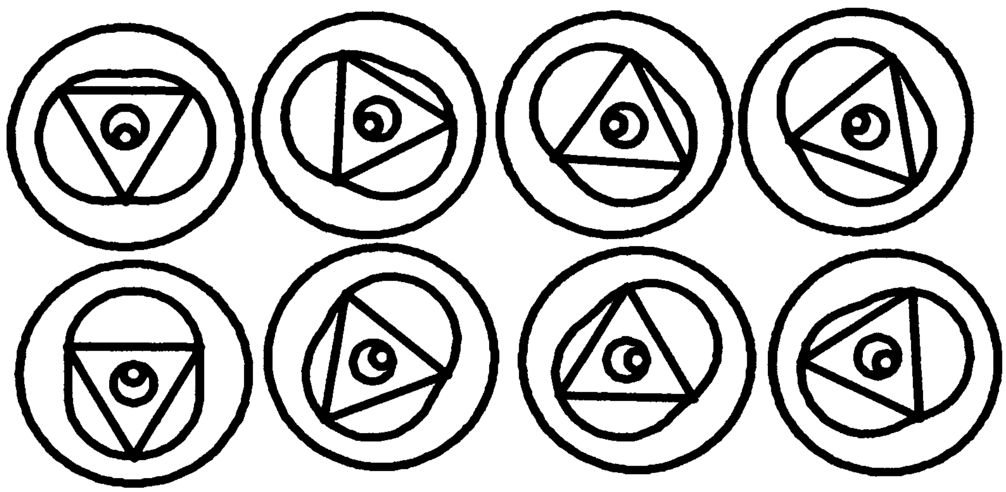
In this case, the piston did not rise, as Wankel discussed here, on a fixed axis, *but on an eccentric*, which assures the standard degree of freedom of basic Turbinary machines, and realizes a rotation of 120 degrees by 360 degrees per rotation of the crankshaft, and consequently requires a gear ratio of 1 to 2, is different from the invention Wankel quoted, which keeps standard gear ratio. Besides, this lack

of retro rotation is compensated with post rotary action of the cylinder, realizing an about half of turn per rotation of eccentric, and consequently requiring a semi transmission.

As the point of first high injury time of the piston, contrary to previous machines, is situated beyond the first high injury time of machines with fixed cylinders, for a value of 180 degrees.

It is important to note, in Turbinary mode, that it is possible to realize an explosion per rotation, as the following representation demonstrates. (see the animation which we provide for more detail)

Fig : 24



Like we can see here, every part is moving.

One notices that the piston rose on an eccentric and that this eccentric turns well and truly. One sees that these kinetics are totally different. One follow-up of the shape of movement of the piston shall show that while the point of Wankel's piston produces the big circle, here, the flattened upwards figure, and lengthens or stretches out downward, reproducing exactly the figure of a highly-rated post rotary material cylinder in which would turn a piston of two sides.

One will note here that the semi transmission will be simply accelerative. Wamkel do not require any semi transmission.

Beaudoin (supplementary remarks)

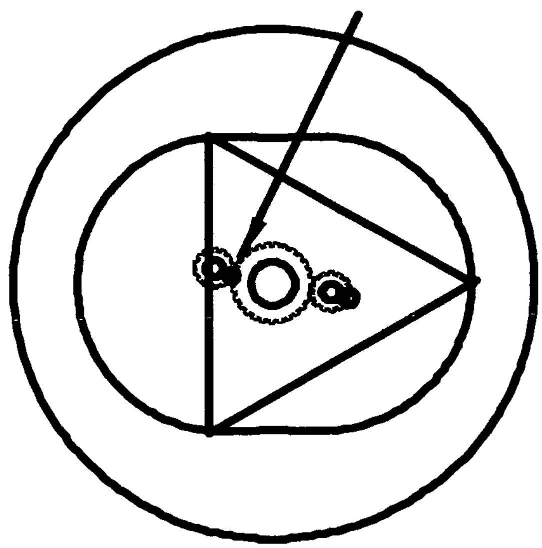
The Quoted invention makes reference rightly to the poly induction support method. This basic poly induction is above all a new method of mechanization of the positionnal and orientational steering of

the piston, when this one is in the conventional kinetic mode, and consequently when the cylinder is fixed.

The poly induction arrives at a division of the internal time of the piston by the addition of two movements, which are that of the supplementary crankshafts in the master crankshaft, and not in a subtraction of a slow, retro rotary orientational movement of the piston on a fast rotation of the eccentric, as it is the case in the support of the traditional piston. The poly induction has the advantage of simply transforming counter forces into denials of the traditional support on the piston into neutral forces. The poly induction reaches to work correctly the piston of a rotary machine.

Indeed, we had noticed, during the application of poly induction mechanics in machines with standard kinetics, during the descent, the same counter pushes that are found in mono induction mechanics. The following figure demonstrates this clearly

Fig. 25

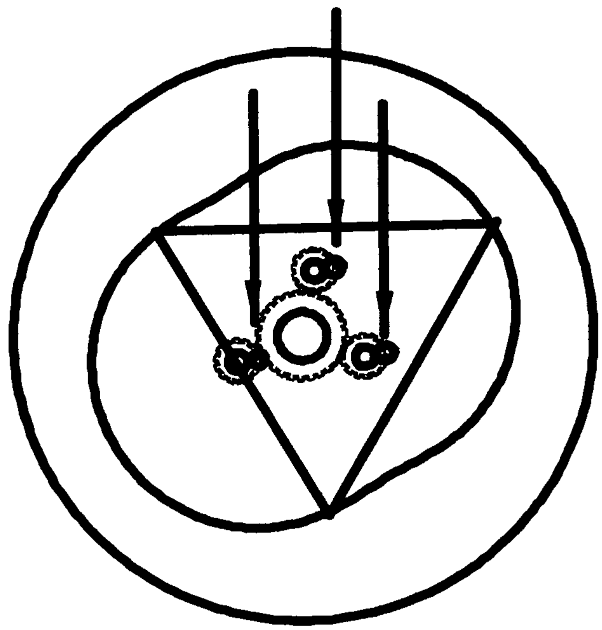


Such as one can notice it in the above figure, during the descent, the subsidiary crankshaft, and the crankpin is situated exactly on the same point of the coupling of the subsidiary crankshaft gears and support gear, and , like Wankel mono induction the rear of the piston remains incapable to produce energy . Now one can not lengthen the length the muff of this crankshaft, which is identical to that of the eccentric of these machines, when these rose with the central eccentric one central.

Now in basic dynamics of Turbinary machines, or in dynamics with translational piston movement, gearing support permit the activating of the cylinder, and also to connect the induction gearings of the supplementary crankshafts among them. The counter forces will be transferred on the cylinder, all will not be no more damageable. Now it is important to repeat that there is no more master crankshaft in translational Turbinary machines, and than the supplementary crankshafts, in the most polar mechanical support, rose directly in the machine block. These crankshafts are so perfectly dynamic, that their crankpins are in behind or before the point of coupling of their gears to the gearing of free

support arranged at the back of the. As a consequence, the rear crankshaft of the piston, in descent, realizes as much energy as the crankshaft before.

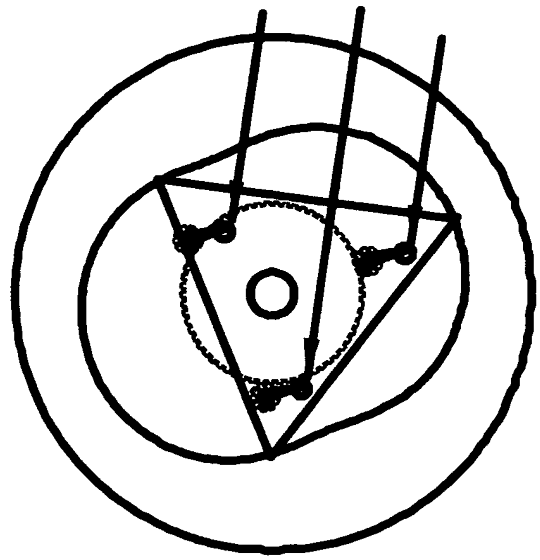
Fig.26



This becomes very interesting, also, during mechanics realizing figures of n sides, of which will recall, as an example, that for eight sides, the figure of movement will be successive, and the figure of sequence by jumps of three, this continuation having already been presented by us in the same animation, and in the figures of the disclosure.

One will notice that during the assembly of the machine by one only inductive piston support, the gear ratios, originally of one to two, will be here of one to eight. **One will notice also, what is of extreme importance, that the length the crankpins of each of the supplementary crankshafts will remain equal to the length in which it came true, in standard dynamics.**

Fig. 27



As one can notice it results that the length of the muffs of the supplementary crankshafts are bigger than that of the beam of these induction gears. This consequence is direct and impossible to circumvent. Contrary to what happens in conventional dynamics, pushes on the crankpins of these rear crankshafts will be stronger than counter pushes of the arm of the master crankshaft situated with this quoted, and consequently, even rear push will be positive, which cannot happen in conventional dynamics.

The retro rotation of the cylinder can be obtained by semi transmission connected to the master crankshaft, or still by decrease of induction from the crankshaft's induction gears. Counter force will be diverted on the cylinder, the support of which is central, and consequently, enormous difficulties due to the friction and to the bad mechanical susceptibility of the expansion will be decreased in a drastic way.

That is why the cylinder, in translational mode is directly connected with the support gears and supplementary link of crankshafts. The crankshaft and all the free gearings being absent, the retro rotation of the cylinder will be realized in opposite direction, at exactly the same rotation speed that the master crankshaft realized in a machine with conventional kinetics and with support by poly induction.

Now in this machine, three explosions, and six compressions happen for every rotation of the master crankshaft. This relation will be maintained in Turbinary Engines, and consequently a compression will happen every 60 degrees of shooting of the cylinder. This knowledge of the equivalence of the ratios of shooting between the cylinder and the former master crankshaft make poly induction mechanics extremely useful when the machine will not be realized exactly as a translational piston.

Indeed, one understands that when the cylinder is fixed and the master crankshaft is in the full activity, and as if this crankshaft had been removed, this same degree of shooting is made,

One understands that while on one hand the master crankshaft does not completely fulfill its rotation, this lack of rotation should inevitably be compensated with a rotation the other way around, in a way that the addition of the rotation and the rotation preserves the same degree of progressive separation of parts through the cycle.

In the translational version of the machine, the master crankshaft is totally deducted from machines, in shooting mode of the strictly translationnal piston. The piston, supported, in its most simple mechanical version, strictly by supplementary crankshaft, realizes a translational movement, while, in the opposite way the cylinder realizes the movement of the master crankshaft, deducted, which means that the cylinder realizes a movement rotationnal or retro rotationnal, according to the type of machine realized, and according to the newly determined place of compression, in which the quantum of rotation is exactly the same as that of the master crankshaft, in conventional version.

This set is inserted into a block of the engine, while the block of the engine is realized austerely in a single piece with the cylinder in a conventional engine. The gearing support of crankshafts is not arranged austerely in the block, but in the cylinder. It is consequently free and rotary, which is not the case in kinetics by conventional poly induction.

However, in any non-translational versions of Turbinary engines which will be able to be realized, one will be able to use the complete poly induction as a support system, which is what will preserve simply partially the master crankshaft, on which will have risen the supplementary crankshafts. As any mechanics however, it will be then of a type and a ratio corresponding to the figures of movement of the piston, or even to that the geometrical figure by taking into account the sequence of realization.

In these last cases, the modifications of the thickness of gearing ratios of thickness of gearings, without the modification of the supplementary beams of crankshaft produce a positive work of the back rear inductions of the piston, what which could not be realized in versions with conventional kinetics.

For example in one geometrical figure in eight, the ratios of gearings support and induction gears will be of one on to eight, while the length the beams of the eccentric will remain the same. (To see previous figure)

One sees consequently that the force of post rotation of the previous eccentric will be superior to the downward pressure on the previous arm of the crankshaft maitre, and than consequently, this one will be positively entrain, led upward. The Mechanics are so perfectly correlative of these new kinetics. Indeed, here, the piston comes down more than it turns.

In conventional kinetics, mechanics obey inevitably obey the logic of kinetics which requires that the back part of the piston stops, and that the part before turns all around undergoes a full rotation, what creates which inevitably creates resistance and against back rear counter force.

It is so clear that if the base of division of time comes from our own poly induction patent , it is not of any utility so much and as long as one did not distribute it in new way, namely between the piston and the cylinder, so as to, by modifying kinetics, to modify the ratios of its ratios, they even are still culprits, because ' they reproduce the negative effects of conventional mono conventional inductions.

In summary, our previous works in Turbinary machines do not contain any kinetics associable to Turbinary machines, which, in any way, was able to be mechanized, and which it would have been possible to understand the positive effects of these mechanizations, and their ratios with the thermo dynamic. We had never been able, before Turbinary engine to realise Turbinary machine on standard degree of liberty, or with only one raising of liberty.

It is important, here, because the concept of Turbinary hatches flows directly from the distribution of the divisions of the time of the poly induction mechanics, between the piston and the Turbinary cylinder hatches, it is important here to note that if there are engines with similar positive incidences, in this case one will choose the piston support.

If one returns for example to the example with geometrical figure of eight sides, but realized by jumps of two, so with 135 degrees, one will see the first top point of the piston happens to all the faces of the geometrical figure, because, even though the sequence of compression is by jumps, the figure of movement of the piston is successive.

In every compression of the same face of the piston towards the next face of the cylinder, the master crankshaft, in standard dynamics turned 180 degrees, In translational dynamics, because the cylinder realizes, in a inverted way, the same speed as the master poly induction support crankshaft. As a consequence, for every compression of the same face of the piston and the following face of the cylinder, it is the cylinder which rotates 180 degrees. One can easily see that the simplest way of calculating the number of degrees of the master crankshaft is to calculate the number of degrees necessary for the next expansion of the same quoted with the piston. Leaving from there, the shape of movement of it is successive, the movement of the master crankshaft will be equivalent as 360 divided with the number of faces of the face of the geometrical figure, or 45 degrees. As for standard dynamics, the dynamics of the master crankshaft should be of 180 degrees, the cylinder absorbing the difference of 135 degrees per high break-even point location of the same face.

In mechanics by conventional poly induction kinetics, attributed to the kinetics of compressive parts, several complex ratios occur. But among the most simple, one can say that the master crankshaft varies exactly of the same number of degrees as the number separating the material figure. So we clearly see that the ratios of turning of the master crankshaft of a Turbinary engine are never the same that in a machine realised in standard kinetics.

Now the same observation applies to Turbinary machines, but, once again by respecting geometric forms. One can now say that the ratios are now relative to the geometrical shape which applies.

Indeed, for a geometrical shape in eight sides, the master crankshaft will have turned 360 divided by 8, on every face. This is completely normal because the induction gears which will be attributed to the supplementary crankshaft will be of at least of one to two, but one to eight. If the high break-even point for the same face happens at every eighth of turn the ratio of the supplementary crankshaft gears

and the support gearing will be of one to eight, and this without changing the length the arms of the supplementary crankshafts.

In Turbinary kinetics, of which we have just seen an example, the relative thickness of gearings is modified, for identical compressive parts. Here, for example, the induction gears of eight are smaller than those of the support and replace a ratio of one to two in these. But the thickness of induction gearings is decreased and that of support increases, but this, we repeat it, without changing the length of crankpins supporting the piston, which must inevitably realize the same diameter of rotation.

it ensues that the crankpins of these are no longer situated on the line of the coupling of gearings, in the back part of the piston, but in front of it. It can so produce a push, which although lesser, remains very interesting, which one can observe in the previous figure the central part of the piston no longer serves to counterbalance the counter effect but can serve usefully, As for the part before, it remains perfectly active. One has to note that the work of the crankshafts is??? perpendicular movement of the piston, leads by an almost translational kinetic, and that we completely affect the objectives of the present invention, which can not be realized by any cited invention.

In conventional kinetics, one forces exaggerated shooting with the piston in course of descent, and it is in the logic of the things that the mechanics by which to produce it, realizes an invisible mending of its rear face and a promotion of its face before.

One thus sees the ratios of the poly induction, when the kinetics are in fixed cylinder, and when the kinetics are Turbinary . When the piston realizes a translationelle kinetic, the master crankshaft is totally deducted from the system, The Turbinary kinetics inevitably establish new ratios, and require different and supplementary devices of realization. When the kinetics realize a figure of opposite type, the poly induction becomes of retro rotary type, in spite of the fact that the machine has one cylinder of post rotary type.

One sees that if the poly induction can be applied in Turbinary mode, it has to respect the new ratios of the forms of this type of machine.

One sees that Turbinary machines produce many kinds of qualities and calculations which were not in the order of our previous works in poly induction which were strictly applied to fixed cylinder circumstances.

Comparison chart

	Beaudoin (anteriority)	Brodov	Schwam	Wankel	Beaudoin
Machine of Strictly Rotationnel degrees	no	no	no	yes	no
Turbinary Machines of standard degrees of freedom	yes	no	yes	no	yes
Machines containin g strictly one output axle	yes	yes	no	yes	yes
Machines posses sing two exit axles	no	no	yes	no	no
??? In which the ratio of in duction and suppo rt gears are of one to one	no	no	no	no	yes
A machine posses sing global piston gu ides to which is attr ibuted the geometric figure	no	no	no	no	yes

	Beaudoin (anteriority)	Brodov	Schwam	Wankel	Beaudoin
A machine in which e xplosions are realize d by alternative faces by step of sides within a geometric figure	no	no	no	no	yes
Machine in which the geometric figu re is realized by mor than one rotation of t he eccentric	no	no	no	no	yes
A Turbinary type machine in which the degree of freedom is incre ased by planetary movement t of the cylinder, by superimposed crankshafts, or by polycammed gears	no	no	no	no	yes
Machine in which the support is realized by Synchronizer	no	yes	no	no	no
Machine in which the bloc and eccentric are mounted on a rigid central part	no	no	yes	no	no
A machine real zing a vertical, or ne ar-vertical expansion	no	no	no	no	yes
Easy to industrialize	yes	no	no	yes	yes

Rings totally Independent from the cylinder	yes	no	no	yes	yes

Relevant

It should be noted that this list could go on indefinitely, but we believe that this is not necessary because this list allows us to distinguish these machines between themselves.

Geometric, kinetic, and material devices

The examiner mentions that it is possible that the geometrical and kinetic limitations of the invention can be similar in construction and not in concrete devices. We are anxious to repeat that if machines can be understood according to the relations of shooting and ratios of gearings by which they can be realized in many engines. It is required to realize these machines according to new ratios implied, but in a way that they remain simple, in other words, to allow the elements of the machine to realize a cycle in an acceptable lapse of time, this producing a capacity to realize the entry points of the gasses successively, and not piled onto the others.

We think so that geometrical devices are completely relevant on one hand to easily consider the machine, and on the other hand to realize it in the preferable gear ratios. These geometrical devices are also absolutely necessary when we want to raise the degree of liberty of the machine and use a part simultaneously as cylinder and piston, or when we want that the same part realise simultaneously a relation with a turning cylinder, and with a fixed cylinder.

Even though invention can be described in algebraic terms of ratios of shooting, or still in terms of concrete gearing ratios, the engineer put in charge of the realization should inevitably receive a reference of which would indicate to him which power should possess the engine, and therefore he should decide afterward not only on the dimension of the details of compression, but also of the number of explosions by turn, and which will be necessary for to realize these explosions.

The most effective method allowing him to realize quickly and clearly kinetic dynamics and its animation is the one that we presented, or method by determination of the figures of movement with regard to the block, geometrical figure, and sequence of realization of this one.

The reason of this is very simple. By determining the machine by its ratios of shooting, or even its gear ratio, one can easily create machines which although they respect these ratios will not be relevant

mechanically. At the risk of repeating ourselves, even though ratios of gearings assuring the retro rotation of the piston are approaching the more desirable ratio of one to one, it is evident that this activation of thermodynamic consideration must be realized as to be able to reconcile the realization of the machine with the others, being simplicity, minimally required space and time of admission et cetera. As a consequence, one can see that although a machine is produced with a gear ratio, for example of 999 to 100, would offer an almost complete balance of push on the piston, and a rise of the number of compressions per rotation, and other specific qualities of Turbinary Machine, it is evident, although the considerations which we have just mentioned, that it would be more desirable and preferable to realize the machine according to a more defined number of faces, which will assure feasible gear ratio and a disposal of openings which will be unique for every entrance or exhaust of gases.

The machine will be perfectly realizable, and many of the objectives of the present invention will be realized there, as for example, a better distribution of the forces on each part of the piston, and an increase of the number of explosions etc.

Besides, as engine, this machine will be with difficulty realizable because the eccentric should turn 999 turns before the original openings become relevant again. It will be necessary to determine gear ratios of 999/1000, what is not relevant. Ignition will be made in 999 different places, which is not either.

The same difficulty risks hardly to happen during realizations of the machine by countering it with material considerations as geometrical / algebraic determinations. One sees so that material determinations, in the application are less relevant than geometrical determinations

We think that to satisfy the demands of the examiner, without depriving the reader of the light that produces the descriptions of geometrical dynamic, claims can be made in two ways, algebraic and geometrical descriptions, which seems to us as being difficult to understand.

Preliminary comment

Any engine is a dynamic mechanical realization, and consequentially realizes a kinetic of elements. Consequently, any engine can be set against the other one not only, for the same kinetics given by parts compressive, by its mechanical processes, but also, by the dynamics of these parts. In this last case, new mechanics, or still, new mechanical ratios are inevitably implied.

Throughout the disclosure relative to Turbinary engines, we did not stop showing links which existed between the new kinetics of these machines, the new mechanics and the new ratios and ratios of gearings that these new kinetics produced.

Naturally, as far as these new ratios can be attributed to numerous existing mechanics, and particularly in regards to the steering of the orientational aspect of the pistons, we agree with the examiner that this

aspect of the mechanics must inevitably be a part of demands, because it is about the material directly corresponding to limitations in the geometrical and kinetic limitations of machines.

Besides, only material limitations can give place to realizations which although feasible as a hatch, it would be difficult as an engine. This is why we think that it remains necessary to the geometrical and kinetic descriptions which were made. We are anxious to underline that, as we are maintaining, geometrical and dynamic prescriptions can be completely acceptable, if it is the clearest way of defining the kinetics of the machine, because not only are the geometrical aspects devices as well, but in addition, more material devices are realized in direct function with the geometrical devices. Even in standard rotary machines, the cylinder is conceived compared to the running kinetic of the pistons, and not the other way around. Here the cylinder is conceived in a more complex way, by respecting simultaneously a running of specific piston, and its own rotation.

We think that to remove the geometrical and kinetic devices of the main claims of demands would clearly have the effect of damaging the light of the disclosure, and to return their very difficult understanding, which would not be desirable.

Indeed, as any more complex machine, Turbinary machines Turbinary s realized as engines require a set of dynamic and material, geometrical dynamic, material, and geometrical conditions which must be realized altogether together, to assure their good functioning. Any fragmented realization can not consequently assure of it assure it's functioning, and the most optimal way of realizing it

We think that it would be completely acceptable, as demand the examiner as the examiner has asked to integrate, as we had done in July, 2009, supplementary demands relative to the mechanical aspects of steering of compressive parts in main claims, but we think as well as it is completely relevant that geometrical and kinetic limitations lie here, in lack of which, counts of possible mechanical realizations would not constitute the most desirable realizations of the invention, and otherwise, an important part of the insight, and the ease of understanding of the demands and their direction would be lost.

With the aim of satisfying these two requirements, we express in main claims, constituent elements of the machine, specific ratios and that we end each of it by clarifying preferable kinetic realization for each of new ratios and realized mechanical devices.

In the two subdued sets of demands here, it simply acts, to satisfy the requirements of the examiner, to integrate the supplementary demands of the first set of 2004, relative to mechanics, directly to main text of the demands.

In our demands of 2004 and 2006 indeed, we had claimed in demand 1 and 2 geometrical classification, and in demand 6 , 7, or 4 , 5 , 7, 22 , 36. We clarified repeatedly in the disclosure and in description of the figures that variations of figures of Turbinary machine are inferring inevitably of new ratio of gearings composing mechanics . The reason of this is that these ratios are no more relative to the material shape of the cylinder, but rather to the figure of the movement of the piston, and to the figure of the sequence of realization of the geometrical figure. We also showed repeatedly the gear ratios which lead such figures. To clarify demands these ratios can be included in demands if it is desirable for a better understanding and a limitation.

Besides, although we will gladly fulfil the request of the examiner, the effect to furnish the main claims of the material devices allowing to give them the necessary substance, we subject that these devices must before any thing be simply defined, as we have done throughout the disclosure according to the new ratios of orientation, for semi transmissions, and according to new ratio of ratio of gearings and type of induction which they realize. It would be dangerous, given the important number of different mechanics capable of realizing relations effects and ratios, mentioned above, to clarify them beyond these ratios. I would be so easily realise a copy of the invention, and it would be also, easy of re submit the same invention, simply under modified mechanical details, what would risk to make an inconvenient continuation of the substance.

However, we continue to think that the geometrical identification of preferable manners to realize the invention and to describe it allow us to confer to the invention and the demands a level of insight which is absolutely necessary for him in a healthy understanding and without which the clear, precise and intuitive understanding of the invention would be impossible.

The following figures recall the standard kinetic end its relation with the strict gearing ratios which must be employed to govern the orientation movement of the piston.

All the following figures show dynamic realisation in which ,the piston is translational, or , in which, the step realisation of the geometrical figure produces a ration near one to one , staying post rotary, or becoming retro rotary.

In this first case, the coupling of the gears will remain in the rear, and in retro rotary means, the coupling will be transferred to the front. But the balance of the piston will stay equal, and the development of expansion remains perpendicular. One can see in each figure that the ratio of negative effort is diminished, and in some cases, totally neutralised.